

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

[The MINING JOURNAL is Registered at the General Post Office as a Newspaper, and for Transmission Abroad.]

—VOL. XLIII.—

LONDON, SATURDAY, FEBRUARY 8, 1873.

PRICE.....FIVEPENCE,  
PER ANNUM, BY POST, £1 4s.

## Original Correspondence.

### CUMBRIAN METALLURGY—No. I.

THE GREENSIDE LEAD MINES.

We purpose to describe a few of the metalliferous mines in the North-West of England; not confining ourselves to the political boundaries of Cumberland, but embracing places comprised in the same geographical area. The most successful mine of this district, in point of quantity of ore, is the Greenside Mine. Situate on the southern slope of the Cumbrian Mountains, this vein has for near a quarter of a century yielded large profits to the fortunate adventurers. The lode is stopped away in its upper portion. Two main levels run along the course of the vein for nearly 300 fathoms, and yield ore rich in silver. From these levels the galena is extracted for many years. Lately a third level has been driven below the other, but, unfortunately, a large vein is occupied with barren rock. In entering this first through several fathoms of most excellent ore, we understand, of any part of the mine. Next comes ground, above referred to, for 200 or 300 yards, which reach good ore ground for a few fathoms more, and so on to the dead ground, beyond which the lode shows no metallic properties, nor has any systematic effort yet been made to try the ground further. The two levels passed through in this level communicate upwards, and the extensive lode worked upon in the two upward levels they seem to keep a good strength, so far pursued. When the upper portions of the vein are exhausted, a smaller number only of miners can be employed, and the pillars upon which the main body of lode seemed to stand, unless compensating discoveries are met with, must reduce the output and value of the mine. Or, to put it, "The vein was evidently standing on

as the English lead furnace. Latterly the form of furnace known as the Scotch hearth has found more favour. This is a cast-iron hearth, of 2 or 3 ft. square, enclosed in a mass of masonry, varying in its details to suit the nature of the ore and fuel. An essential condition is the sloping channel in the sole of the hearth, to allow the liquid lead to run off as soon as formed. The smelted metal is uniformly purer by this than by the English process, chiefly on account of the lower temperature employed, which fails to reduce the foreign matter present in the ore, and which would contaminate the lead.

The flue is an important part of the smelting establishment. At these works the chimney has been extended at various times. At present it is 8 ft. by 9 ft., and about 1½ miles long. The oxide of lead is carefully collected at intervals, and reduced to the metallic form, in common with the litharge produced by cupellation. The amount of metal obtained from the dressed ore is as follows: From first smelting, 65 per cent.; from reduction of slags, 5 per cent.; from oxide from flue, 4 to 5 per cent.: making a total of 75 per cent. This figure, which appears tolerably good from a theoretic value of 84 per cent., is greatly eclipsed by the produce of the Stanhope Smelting Works. Here they obtain 66 per cent. from the first fire, from 4 to 5 per cent. from slags, and as high as 10 per cent. from the flues. To accomplish this a peculiar form of condensing chimney is used. The flue is large in section, and the draught, consequently slow. It is still further impeded by the introduction of brushwood and discs into the chimney, against which the sooty matters dash, cool, and deposit the oxide. Along the top of this horizontal flue runs a tank, perforated with very fine holes, to allow water to drip through at intervals, and damp the brushwood and other obstructions in the flue, thus causing the oxide to adhere. To make the supply of water in the tank intermittent, an oblong vessel is fixed immediately over it, capable of turning on an axis. The vessel is first fixed slightly sloping, and is supplied by a small pipe with a gentle stream of water. At the end of a certain time enough water has accumulated in the lower part of the vessel to overbalance it, and precipitate its contents into the tank below, which, by means of the fine holes below, would damp the interior of the flue; the water vessel meantime would, after discharging its contents, right itself again, by the force of gravity, to recommence the same intermittent action.

### THE CUMBERLAND COAL FIELD.

SIR,—Your correspondent writing from Carlisle in the Supplement to last week's Journal is quite right. I am not a native of that district, and have only got what knowledge I have of the district from occasional visits to it, and from books. He gives a quotation from the Carlisle Journal of Sept. 28, 1807, where it is stated that trials were made for coal at a point about two miles from Carlisle, and a seam of coal was found 4½ ft. in thickness. If your correspondent can inform us at what depth this seam was found, and how far it extended, and also what depth the bore-hole is put down which he mentions in the bed of the Eden, it might prove very interesting.

It will be seen from my former remarks on this interesting and very important subject that our opinion is trial bore-holes have not been put down to a sufficient depth to prove this strata. The depth of the best seams near Maryport are from 130 to 150 fms., and good seams may possibly lie at a depth of 200 or even 300 fms. about Carlisle.—*Newcastle, July 4.*

M. E.

### COAL MINES REGULATION ACT, 1872.

SIR,—Referring to the letter of our friend, Mr. Hall, in the Supplement to last week's Journal, who I must say has always given your readers a clear definition of the different parts of the Act of which he has written in your paper; but thus far it does not appear to rest with the clear meaning there laid down, neither by the Act nor the circular since issued from the Home Office. It appears that those in authority at the Home Office have power to refuse to grant certificates on application and proper representation of facts being given in accordance with the meaning of the Act. What then can men do? they become powerless, and apparently useless; there is nothing left for them but to retire from their situation. I will give you an instance without mentioning names, which I could do, several having occurred in this district. A man having been, and is yet (though without certificate), manager at a large colliery for upwards of 20 years. This man has made application in accordance with the requirements of the Act for a certificate of service, and has received official refusal; the same owners under whom he has so long served are wishful to make him their certificated manager; under those circumstances I cannot see, with Mr. Hall, the appearance of any false conception of the protection held out to the owners.

I would ask, in the true meaning of the Act, why should an owner be held liable for the non-appointment of a "probationary" manager when he has already a good and tried man, who has served him to his (the owner's) satisfaction for 20 years, and the same man being in every way according to the Act eligible as holder of a certificate of service? Mr. Hall again says, "but I think that wherever the special rules of a district have constituted any man a manager," &c. How can the special rules constitute a man a manager under the Act? It is the granting or holding of a certificate that constitutes him manager. The impression is general in this district that a manager has no right to sign the new special rules unless he be a "certified manager"; therefore, for want of "certified managers," the new rules are not issued, or even posted up in or about the mine, as required by the Act, and the reason why the certificates are not issued rests with the Home Office authorities; therefore, in justice, putting the law on one side, how can a man be liable to any authority when that same authority refuses to allow him to do that which the law says it requires you shall do? With all due deference to your able correspondent, Mr. Hall, I beg to say that correspondent, "Middleman," did in his letter in the Supplement to the *Mining Journal* of Jan. 11 express the opinion of that class of men in this district.

ONE OF THEM.

### DIRECT CENTRAL-LIFT STAMPS.

SIR,—Since I read Mr. Rowland's letter, in last week's Journal, respecting the concrete having failed to stand the hard blows of the central stamps, I began to think whether they had mixed the material properly, as it stands all right at other mines. I accordingly

waited upon the secretary, and asked him if he knew anything about it. He read me the letter, and it goes on to say that when the trench was ready, and a great part of the lime, gravel, and sand had been properly mixed, and thrown in, there came such a flood of rain, filling the trench, and, of course, spoiled the lime, and hence the failure, so that, in fact, it was no concrete at all, worse than mere mortar. Well, it will be a lesson for the future, as I find it very difficult to get anyone to believe that the foundation requires to be so very solid.—*James-street, Old-street.*

J. WALKER.

### THE NORTHERN INSTITUTE OF MINING AND MECHANICAL ENGINEERS.

SIR,—A great calm appears to have come over this powerful body; no doubt, however, they will wake up soon, and the viewers and mining engineers may well be excused when it is considered that they have at present the New Mine Act and its introduction to contend with. When this Institute was first established it was an institute of viewers and mining engineers purely, the late Mr. Nicholas Wood being the first President, and during the period when he filled the chair, which continued many years, a large number of practical papers were produced of a most valuable kind, bearing upon coal mining, the mode of working coal, of ventilating mines, underground haulage of coal, &c. The most prominent members of the Institute during the first years of its existence have nearly all passed away. Mr. Nicholas Wood, Mr. W. Anderson, Mr. W. Barkus, Mr. T. J. Taylor, Mr. Atkinson, Mr. T. V. Hall, all of these are gone, and some prominent members have removed to other districts, which prevents them taking any active part in the affairs of the Institute. By the way, it appears to be remarkable that in the Wood Memorial Hall, the splendid building in which the meetings are now held, only one statue has yet been erected—that of the first President; surely busts at least of many others ought to be added. Many of them deserve to be remembered.—Mr. T. J. Taylor, Mr. Hall, Mr. Atkinson, and others.

The Institute at present presents a marked contrast to the earlier Institute, when the members were simply viewers and mining engineers; now they may be divided into several classes—mining engineers; viewers, mechanical engineers, metal brokers, merchants, mine agents, and general agents, and last, but not least, professors, real great philosophers, these being connected with the College lately established in Newcastle. The society is in a most flourishing condition, but we fear that it is getting far too cumbersome and heavy to work well; far too little discrimination has, we submit, been exercised in admitting members. The society for all practical purposes ought to have been confined to mine managers, viewers, and mechanical engineers. Merchants and general agents really have no right there, and the reasons that induce them to join the society are obvious enough. It is to be hoped that the practical coal miners will keep their heads up in this now gigantic institution; if they do not another institute will soon be wanted in Newcastle. The coal of the Tyne and Wear basins is the foundation of the great and ever-growing wealth of the district, and it must not be supposed that we have arrived at anything like perfection in the art of coal extraction. It is a question whether many other districts have not already outstepped us in the race. Very little progress has been made here yet in long work, in getting coal by mechanical means instead of hand labour, and even mechanical ventilation has as yet made little progress here. There is some reason to fear that the oldest coal field, or the managers of the works thereon, have fallen into a sort of lethargy. With respect to the Institute, the practical miners who are members ought to contribute liberally papers on improved modes of working, and especially on working coal by mechanical means, and many other topics if we are to keep abreast of the times—as to keeping in the van, that position is we are afraid almost lost now.

*Newcastle-on-Tyne, Feb. 5.*

AN OLD MEMBER.

### N. ENNOR ON TIN DRESSING AND SMELTING—No. IV.

SIR,—I next take up No. 3 letter (dated December 28). In that I showed that tin may be and is reduced to slime, small particles, and atoms, and sent down any river, even to the sea. To do this I contend that extra large heads are used. They are worked slow, and the tin is pent up with small upright grates, of not above a fourth of the proper size. It is only to be compared to a felon pent up in a jail, and told to stay where he is, and he shall not come out until he is stamped to fine slime and fine particles. We care not how much goes off in atoms to sea, as no one can see them. The old stamps grates give the rough tin no chance to get out; it is bound to fall back and settle under the heads, and I see no proof that the best tin may not remain there for a week, or until it is stamped to atoms. The best tin is the first that goes to fine particles and atoms, and then the troubled-waters take them to sea, and from there to the Atlantic Ocean, and lost for ever. I am aware it is now the custom to stop an hour or an hour and a half at midday to clear the grates. I recently looked on while they were doing so; the grates then had not above 3 or 4 inches clear. It might be said by a looker-on that it was only foul water that escaped, but it is foul water that carries off particles and atoms. If we suppose the tin stamped from these mines to contain from 1 to 2 cwt. of tin to the ton, I argue you should have three times the sized grates, twice the sized holes, and a quicker movement with the stamps, so as to let everything escape as quickly as possible. Everything coming from the stamp should pass to a self-acting jigger, close outside, and through two if required, the bottom of the sieve to be the largest size. Your practical agent and dresser knows the size which would best suit the tin that goes through. The ragger would be chiefly hitch tin; all the rougher tin, and what contained hitch tin, would stop in the sieve, if not in the first it would in the second, the waste still passing on to a round revolving griddle, from it the slime passing to one bubble, and the rough waste to a second one. Many may argue that there would be hitch tin in what goes to the rough bubble. I believe it would be found too poor to pay for handling over again, and the slime would not be half the present quantity—not above one-fourth; then the best round tin would be found in the hutch, and of a much larger size than is now produced. These hatches should be self-acting. What was retained in the sieve would be chiefly round grains and hitch tin, I should say worth 5 or 6 cwt. of tin to the ton. Pass this through a good rubber, or a properly made stamp, with a jigger machine and deep slime pits, one for day and one for night, and run off the clear water after

12 hours standing, as this would be far better slime than from the first stamping. It might be argued that this would require a second stamping; this I admit, but it would be only a very small portion, as this would be best work. I notice your round bubbles are worked badly. You work the rough and slimes together from many of the stamps. Slime should be divided from rough as soon as possible, and worked by itself, otherwise the rough will carry slime off with it, even round particles of tin, such as is caught by the squatters. Where does good tin come from to them else to pay but in the slime? I may ask the squatter tin dressers if they could not catch all the hitch tin which comes down the stream to them by self-acting jiggers in the running stream, and if they think what passes through the jiggers would pay them for going through stamps after? The foregoing remarks refer only to tin requiring but little burning.

I take contaminated tin ore in my next. In answer to this letter someone replied who appears to know what he is about. I only differ with him on one point, that is fine stamping. I say still stamp rougher, and catch the rougher hitch tin in self-acting jiggers to rub down or re-stamp. In doing this you will catch tin of more value and far less cost than if you stamp it to slime; in fact, I argue that you will retain tin of far more value to the smelters. A second person remarks that I said the mine agents are concerned with the squatters. I think he will on reference to my former remarks find it *vice versa*, but I argue that it should be practical men to take up these subjects, men who actually do know tin by the light of a candle and in a poor air mine. As my object is to get the opinion of men who are masters of these subjects, and not to let in such men as the late rather shrewd American to criticise, as it is bad. I say we have still able and practical men left in Cornwall, and I am doing my best to lead the way and draw them out, when I hope we shall devise means to make the required improvement among ourselves, and not be beaten by outsiders who have had no practice and do not know tin. I may notice we have a great many men coming out with new stamps, none of whom know tin, still these men certainly have a claim of erecting stamps, as they all style themselves professors and engineers; if so, they have an undoubted right to try their hand at stamping. I wish them luck. I shall have to touch again upon this some future day, but I do think I must omit replying to even miners or others who have had little or no practice in tin mining and dressing contaminated tinstone, as it requires a thoroughbred practical miner to know tin—men who know tin and how to treat contaminated ore after they found the mine which contained it, and how to stop tin from going to the sea. It is admitted by the best mining authorities that the agents of mines which empty their refuse into the Red River are the best tin miners of the day; they are known practical men, born and bred I may say in these very mines, and many of them have had to do with cleaning tin all their lives, and with all their skill they know they are letting too much tin go down the Red River to the sea. After I have fairly opened the way I have not the least objection for the would-be experts to take up this gauntlet, and try their hand with those men who are good practical tin miners. A few of them may have some self-conceit about them, and I know such men are stubborn customers, and it will require men who know tin to take it out of them.

N. ENNOR.

#### TREATING LEAD SLIMES—THE MENDIP HILLS.

SIR.—The letter in the Supplement to last week's Journal from Mr. Walker seems strange to me. He says he never heard of me. Strange as this appears, it may be true. In return, I say I never heard of a Mr. Walker ever being on Mendip Hills, but when I was officially called in I was informed that the mine he alluded to had been worked by a Mr. Johnson and others, under the management of some would-be practical, who sank two new shafts on the back of the lode, and attempted to wash and smelt ore until they ran the company so many thousands of pounds in debt that they were glad to get out as best they could, as they neither knew how to catch the slime or smelt the lead. So as to half pay expenses, they adopted a plan, as this gentleman says, of washing out the slime and picking out the old slags by hand. The slime they washed out was sent into a hole, commonly called a swallet; from there it washed for miles underground, and came out into Cheddar fish-ponds and filled them, for which the company had to pay damages. I have taken samples from these ponds since, producing 8 per cent. lead. Then they smelted their slags without a sufficient length of flues, and the lead was carried over the adjoining lands to such an extent that an action was brought, and the company had to purchase all the land; this wound them up minus of a sum which the Journal of that date will show. After this it came into the hands of the late company, when Capt. Harper and the engineers, and all concerned, were discharged. As a matter of course, the former company gave them a very deserving character. After this I was called in to advise, and Captain Hornblower to manage and smelt the ore; and your Journal will also show we soon brought the mine into a dividend-paying state.

With reference to my lawsuit, and the slimes and smelting referred to by me, it was on the Mendip Hills, near Priddy, and was carried on by me solely on my own account. I was in the law court about 40 days, and came out with all my law costs paid, and nearly 20,000*l.* in pocket. What can Mr. Walker say to this? Will it awake him out of a trance?

N. ENNOR.

#### MINING SECURITY.

SIR.—It is supposed on all hands that an investment in any mine is fraught with most uncertain results. To a certain extent there is truth in this belief; but, on the other hand, the total loss by British Mines is not so great as in Foreign Bonds, Mortgages, or Government Securities. In the latter item alone the sum total lost at the moment of writing amounts to (as far as English investors are interested) 40,000,000*l.* sterling. But one-tenth of this sum will be fully in excess of the amount lost through mining failures. There is, indeed, much knowledge, judgment, and discretion to be employed by adventurers in mining speculations, and it is, perhaps, those only who are wanting in some one or all of these qualities, and also engaging in investments whereof they are ignorant, seem systematically to lose and mislead. There are in England 107 copper mines, of which 30 pay dividends; tin 142, of which 39 pay dividends; silver-lead 36, 5 give dividends; and lead 85, of which 17 pay dividends. The following are the degrees of profit (the fractional representation unreduced):—Copper .280, or 30-107; tin .275, or 39-142; lead .200, or 17-85; silver-lead .139, or 5-36; lead and silver-lead .182, or 22-121; British mining .246, or 91-370.

Thus, of all mines, copper mines are the safest for profitable investment than tin, lead, and silver-lead, and lastly silver-lead. An intending investor will find his money safer in a quiet steady-going mine, rather than one much in brokers' hands. Thus, the Trumpet Consols (tin), which is seldom seen in any broker's list, is perhaps as safe a mine, as it certainly is one of the most stably managed, as any British or foreign adventure. A mine of this description is, however, quite appreciated by its shareholders, and, as I myself have found to my disappointment, shares are seldom met with to any extent. Instances might be given, no doubt, of other mines of this description, but this example is fresh in my memory, having lately been courteously conducted over it by one of the gentlemen in charge. Progressive mines should, in all instances, be thoroughly inspected by the intending adventurer, either personally or by a competent person, if possible, of the district.

Of Foreign Mines, the most numerous are in gold, of which there are 40, 8 pay dividends, the whole 8 selling for 1,140,000*l.* as against 1,600,000*l.* English tin and copper; in lead there are 5, of which 3 are profitable; silver-lead 4, of which 3 pay dividends; copper 18, 8 pay dividends; silver 25, 10 pay dividends; 1 tin mine, it pays dividends; 1 zinc mine, it is unprofitable. The following is an analysis of the whole (fractional representation unreduced):—Lead .6, or 3-5; silver-lead .75, or 3-4; copper .444, or 8-18; lead and silver-lead .333; gold .2; silver .4. Thus, in foreign mining we find lead, silver-lead, and lead and silver-lead together, transposed (if we omit the solitary tin mine) from the bottom of the list to the top; then in order of safe investment copper, silver, and gold. The position of the precious metals on the list, and the selling value of

even the successful "gold mines," may be noteworthy to any intending investor.

H. SCHULTESS-SCHULTESS-YOUNG.

*Knowlings, Bovey Tracey, South Devon.*

#### ECONOMY IN MINING.

SIR.—We hold the opinion that economy in mine management is now-a-days the chief essential to success—not a cheese-paring, grudging system of economy, as is practised in high places at the present time, but a liberal spirit regarding improvements in practical mining, a readiness to profit by every saving in expenditure that genius and knowledge can effect, a steady desire to utilise as far as possible the natural resources of a property, and a thorough and sincere determination on the part of an executive to expend as small a sum annually as is consistent with the true interests of an enterprise on purposes not immediately reproductive of a return. One of the principal causes of the failure of foreign mines worked by English capital has, without question, been the money recklessly squandered in London management expenses. Take the case of the Taquaril. How much of that 100,000*l.* so soon dissipated, ever reached Brazil, and how small a portion of the meagre sum landed at Rio ever found its way up country? We find the same thing, in a greater or less degree, repeated in the majority of the foreign mines on the London market. Why, the London expenses of the Emma alone are sufficient to vigorously work a dozen British mines! And we may also see, on a smaller scale, a great deal of waste and extravagance in our mines at home. In directors' fees, in London office expenses, in the too liberal payment of too many officials, in extravagant working of mines, in the use of old-fashioned machinery and dressing appliances, where as much metal is lost as is raised, and in other things too numerous to mention, are often dissipated the profits which would give a handsome return to the shareholders. So generally do these abuses obtain in mining, that we are assured your readers will feel equally interested with ourselves in taking note of an instance where these obstacles to success have been avoided, and in which it would seem every pains have been taken to economise capital and disown useless and unproductive expenditure. We refer to the Denbighshire Consolidated Mines, the report of the meeting of which appeared in your last issue.

Before commencing an examination of the accounts we desire to pay a well-deserved compliment to the manner in which they have been prepared. A more exhaustive, clear, and complete balance-sheet was never presented to any meeting of shareholders than that prepared by Mr. E. J. Bartlett, the secretary of the Denbighshire Mines. Having said so much as to the balance-sheet, we will take its items *seriatim*. Beginning at the fountain-head of all failure in mining—viz., extravagant payments to vendors—it is satisfactory to find that, out of a capital of 18,000*l.*, in 3*l.* shares, the cash payments on account of purchase of mines was 277*l.* 5*s.* of the total sum of 10,027*l.* 2*s.* disbursed in accordance with the terms of purchase, the vendor accepting 975*l.* in shares, so great was his confidence in the success of the company. So much for economy in the most vital point of a company's history. The legal expenses generally run away with a good round sum; the entire law charges in connection with the leases and registration were 170*l.* The cost of machinery and plant (including a 2*m.* cylinder pumping-engine, winding-engine, pitwork, &c.) was 1357*l.* 2*s.* 6*d.* We cannot judge of the economy in this department by the figures; true economy would look rather to efficiency and adaptability. On this head it is sufficient to say that existing arrangements are so complete that, notwithstanding the recent heavy floods, and although the fall of rain has been almost unceasing, the engine has at no time worked at more than six strokes per minute, and the water is now so far conquered that a speed of three strokes per minute is ample. The amount expended upon the mine, &c., up to Dec. 31 has been 1314*l.* 9*s.* 6*d.*; and, although we might fairly expect in the first year of company's existence a large outlay in London, which would not be likely to be repeated, the small sum of 233*l.* 19*s.* 8*d.* represented the whole of the outgoings under this head. Nor are the amounts expended in London and at the mine given as lump sums. Of the 1314*l.* 9*s.* expended on the mine 251*l.* 14*s.* 6*d.* have been spent on shafts, 7*l.* 4*s.* 4*d.* on levels, 81*l.* 13*s.* 4*d.* on rent, 80*l.* 19*s.* 11*d.* on sawyers and carpenters, 68*l.* 12*s.* 11*d.* on smiths' work, 101*l.* 16*s.* 11*d.* on sundries; tradesmen, 398*l.* 0*s.* 3*d.*; incidentals, 8*l.* 4*s.* 7*d.*; carriage and horse work, 67*l.* 4*s.* 4*d.*; and wages, 184*l.* 17*s.* 11*d.* As making the total of London expenses printing and stationery figure for 30*l.* 8*s.*; eight months' office expenses and salaries, 100*l.* 16*s.*; interest paid to shareholders on calls in advance, 5*l.* 5*s.* 8*d.*; travelling expenses (four journeys to the mines, including attendance at the Maes-y-Safn sale, where the machinery was bought an excellent bargain), 45*l.*; and directors' fees for six months, 52*l.* 10*s.* The assets are:—Cash at banker's and at call, 1152*l.* 5*s.* 6*d.*; and reserve of shares unissued, 375*l.* Of this latter amount 500 share were issued at the meeting, and at once subscribed for, for the purpose of purchasing an engine to develop the western portion of the sett. Thus the total assets were 4902*l.* 5*s.* 6*d.*, and there was not a single liability of any kind or description.

The progress made in developing these extensive mines, sinking operations having been commenced only in May last, is truly surprising, and reflects the greatest credit on the executive, and affords reliable grounds on which to base hopes of a bright future. The present depth from surface is 124 yards, and pumps are fixed to the 112. The great bulk of lead which was raised by former workers was from a course of ore starting almost at surface, and dipping rapidly east. The indications of an early intersection by the 112 in a few yards further driving of the run of ore are most powerful. The lode is 4 ft. wide, composed of carbonate of lime and small specimens of silver-lead, as if the miners were at the point of entering the course of ore which is known to exist. To further ascertain how far the discovery might be relied upon as being of value, the agent cleared out the 72 yard level, and this proved, in the words of Capt. Pryor, that the ore had been followed in peculiar way, and had not the produce proved rich it could not have paid in the unmined-like manner of exploring adopted. For the whole distance down this incline the lode presents indications which point unmistakably to good results; for many yards the vein is still standing, and in places will turn out to be worth 15*t.* or 1 ton of ore, per fathom, which can be taken away immediately the rise from the 112 is communicated, which is a matter of a very few days.

Capt. Pryor says—"Great satisfaction can be expressed at this point, as if the former workers could afford to leave much valuable ground, our chances must be exceedingly good in meeting with a splendid discovery at the 112. To better explain, we may add that under the old system it was impossible to work this ground, hence its existence. The engine-shaft at that period was not sunk, and no machinery existed. In the 112 west a sump was discovered about 140 yards from shaft, sunk 11 yards. The same has been cleared, and six men placed to drive east upon a lode 18 in. wide, composed of spar and lead ore; at present it will turn out 1*t.* of lead per fathom; the character of the ground is good. In driving the upper levels nothing of this has been seen, thus proving to our minds that it is a new run of lead ore. From very recent diallings it is found that the lode is taking a well-defined course, and will form a junction apparently with another vein to the west, where a great deposit of ore will, without question, be found."

Parry's shaft is now 27 yards deep. In less than 25 yards further sinking it is believed a great body of ore will be met with. To vigorously work this portion of the sett a new portable engine will be purchased immediately, and for this outlay the agents feel every confidence that the shareholders will be richly rewarded, as the ore reported as left is undoubtedly a fact, and the unanimous feeling with all practical mining authorities in the neighbourhood is, that in this part will be opened up one of the richest mines in the Principality. The sett is most extensive, being nearly 1 mile long on the course of the lode, and 1/2 mile in width, and possessing veins that have already produced hundreds of tons of lead ore at shallow depths; therefore, there exists the greatest encouragement to develop the property energetically, and to push on as many points as possible. The policy which animates the directorate as to the working of the property is one which will commend itself to every thinking man, whether he be a practical miner or simply an investing shareholder. In the words of Mr. Bartlett at the recent meet-

ing, "We know that slow mining is a great waste of money, and having such a sett, large enough for two or three companies to work, and possessing capital, I do not think the time will come until they will at all have come up to the requirements of workings. We have now 40 men employed, and I hope to announce in the course of a few weeks that we have 100. Knowing we possess a good mine, the best way to account is to develop it quickly."

The future of these mines, in our opinion, is assured. Every essential to complete success—inherent wealth, economical management, a small but ample capital, and a market for their produce. We do not pen these remarks to puff the shares; they will in due time come from us attain their proper position in the market—share—but from a strong wish to keep the surplus capital at home, where it may be laid out to far more advantage than abroad. The Denbighshire Consolidated Mines, though one, are by no means a solitary instance of a sterling concern. We need not go out of Wales to mention a dozen Van Consols, now close on the realisation of the most wished of its shareholders; there is South Merlyn, with a capital of 5000*l.*; there is Gorsedd and Celyn Level; the Esgair Lle, well managed, and with prospects of the like; there is the old Bog Mine, in Cardiganshire; and closely by, there is Tylwyd, of which Capt. Walter Eddy reports, and which will be brought before the public with a capital of 12,000*l.*, in shares of 1*s.* each, in the middle, in the case of a foreign mine, would die beneath his notice. It is too much the fashion to decry the of our own country in every branch of society, and in more than mining, whereas the truth is, if developed with dill more quickly or more largely productive of benefit.

Gresham House, London, Feb. 5.

HARLAND

#### LOSSES IN THE DRESSING OF ORES.

SIR.—When I first read your Glandore correspondent's last week's Journal, I thought they were incited by someone else had written; but it afterwards occurred to me, on notes, that it might have been my letter of the former which gave him umbrage, and provoked that piquancy of style in—more piquant, I may say, than perspicuous; but, however, others have as good a right of judging as myself. It is prising, from the narrowness of mind he betrays, that he that an unqualified negation requires no proof. The sum of the assumptions of one party by another does not remove a burden of proof from the side whence the assumptions come. Your correspondent is desirous of exhibiting what he knows of subject, I will, with your permission, provide him with his performance. I deny that any propositions which been published in the *Mining Journal*, in reference to the are of any practical value; but, on the contrary, if adopted on the one hand to additional expense without corresponding benefits, and on the other to an increase of the losses. It will devolve on those who contend for the opposite to prove of proof in favour of the assumptions they maintain. It do to regard the expression of their opinions as synonymous facts, nor their mere assertions as the deductions of an indulgence may suffice to gratify and flatter the vain soul, but will answer no end beyond the province of self.

To lessen the losses in the dressing of tin it will be necessary to alter the mode of its treatment at the early stages. The process of dressing by beginning again at the end, and to such a course either a practical or scientific improvement great an absurdity to be received as the earnest recommendation of any practical Cornishman. I should be glad if your correspondent would take upon himself to state, and in his own name, the practical ideas or scientific principles have been advanced in letters which have appeared in the *Mining Journal* on the I am very well aware that it is common for some men to vehemence and strength of assertion what they lack of judgment; but such a delirium, though sufficient to do intellects, will be ineffectual with others. There are greater mistake than to suppose that the dressing of tin is proved by beginning at the tails, and it is scarcely credible one calling himself a miner should be found who entertain idea. I repeat that no radical improvement can be effected dressing which does not aim at the earliest stages to effect a separation of the stuff as possible, according to the gradation from the difference in the specific gravity of minerals, whether as mere oxides of the rarer metals or metallic ferrous minerals—the ores of omecore.

Liskeard, Feb. 5.

ROBERT

#### MINING IN CORNWALL—No. II.

SIR.—If I may venture an opinion, some of the best properties in the western part of the county are still kept secret for which I cannot tell, unless it is the ignorance relative to them, or the inability to obtain grants. In my referred to the great success of the Mellinear Company, I thought there were properties in the neighbourhood well noticed. I would here call attention to the piece of all ground standing between Great Wheal Alfred and the Alfred Consols on the same lodes. There is here a large mineral ground entirely unexplored, and there is no reason why this ground should not be quite as productive as that which have been worked both to the east and west. The ore on these lodes were generally discovered at the surface, tinned to a depth of 150 or 200 fathoms, at a great distance from each other. Now, in the Great Wheal Alfred the lodes dipped westward, and they followed them in that direction they continued, and then suspended operations. I should see an engine-shaft sunk about 300 fms. west of the granding of the old mine, where I believe they would have a great advantage; it would amply repay those who would venture to enter it.

At a little distance to the south of the Mellinear Mine, another course of lodes in a most beautiful formation, but face of rather an inviting character. I believe that it was 25 years ago; a slight trial was made here, and copper was worked by two different companies, and each working proved success in the trials went. Thousands of tons of ore were raised and sent to the last time of working they sank an engine-shaft, at my father's insistence below the adit, and from this shaft alone they raised ore to the surface. They extended levels east and west of the shaft as far as the ore went, then abandoned them. I am not aware that they sank a single shaft between the levels. Here is yet a beautiful mine for someone to take cognizance of it, and get a grant to conceal it immediately. On the same estate a mine had been abandoned, by the name of Wheal Kayle. This mine was worked by two different companies, and each working proved success in the trials went. Thousands of tons of ore were raised and sent to the last time of working they sank an engine-shaft, at my father's insistence below the adit, and from this shaft alone they raised ore to the surface. They extended levels east and west of the shaft as far as the ore went, then abandoned them. I am not aware that they sank a single shaft between the levels. Here is yet a beautiful mine for someone to take cognizance of it, and get a grant to conceal it immediately.

Adjoining, on the east, is another mine, which was shortly afterwards worked for three or four years, and then given up. This mine was worked by two different companies; going round to the west of the Great Wheal Alfred and Alfred Consols; going round to the west of the Relistian, Rosewarne, and Wheal Hope Mines, which have been the largest dividend-paying mines in the county. On the south are the mayne Mines, which were in continual working for nearly 30 years, and have been worked by three different companies: the first commenced 80 years ago, when they erected a 14-in. cylinder engine, and sank a shaft below the adit, which is 25 fms. from surface. With this small engine the adventurers realised a profit of 19,000*l.*, and the mine was given up. The second company worked for 20 years, and were working at 6*s.* 8*d.* in 1*v.*, in consequence of the inadequacy of machinery, and the half-heartedness of the adventurers. Twenty years ago the mine was worked by another company, who only sunk 20 fms. without extending any levels except a cross-cut south, to intersect the main lode. They extended levels east and west of the shaft as far as the ore went, then abandoned them. I am not aware that they sank a single shaft between the levels. Here is yet a beautiful mine for someone to take cognizance of it, and get a grant to conceal it immediately.

## SUPPLEMENT TO THE MINING JOURNAL.

155

3. 1873.]

, the latter reaching as high as 130/- per ton as brought to surface, a level a crosscut was driven on the course of the floor, from which was raised a upper lode in the centre of the property, from which was raised a of grey and yellow copper ore. From this and the counter lodes were raised to give a profit on the last two months working, but a taking place between the agents, a disagreement occurred between and adventurers, and so the mine was forthwith abandoned. This and a beautiful formation—a light blue killas—traversed by a great and the producing lodes, and certainly deserves a vigorous trial. R. BOBROOKS.  
I will continue my remarks next week.

*Eskdale Vale, Carnarvon, Jan. 29.*

## GOGINAN, AND BWLCH CONSOLS.

attention has been directed to the prospectus of the mining Company, in which a statement appears that it is to continue the deep adit under the Bwlch Mine; I cannot that the statement referred to has been made in error, as the of the two mines is clearly defined, and the properties lords; besides which Bwlch Mine has an indefeasible whole of the land comprised within the limits of its R. NORTHEY, Manager of Bwlch Consols.

Feb. 4.

## ST. DENNIS TIN MINES—THE TRIO.

Having lived more than 20 years in this locality, and having attention to mining, I have naturally formed an opinion of the wealth of this district, and would consequently feel interest in any undertaking likely to conduct one from the opposition to that of bare fact, so that I hailed with pleasure the successive starting of the trio—Wheat Mary, St. Dennis and East St. Dennis Consols—and so far have attentively observed that a sufficient apology for thus employing your and will be afforded, provide the writer (which is his one intention) the limits of discovery already made, writes in behalf of *bona fide* at calling the attention of the public to a nook in Cornwall, till deservedly neglected, but which, through the spirit of enterprise, bids its mark. Let it also be premised that what is said respecting any important modification to the other two likewise.

*Wheat Mary*, as was observed by "Cornucopia" not long since, significant specimens of tin ore. This says much, but only a whit of have been affirmed in favour of this sett. The number of lodes, their stratum, and other features more or less important, merit for it a no mention. The great north lode is nearly 20 ft. wide, and very rich, I believe. It is of a high mining authority, "full of tin." The celebrated Pley lode has been proved to be of great dimensions and value. Pley lode has been proved to be of great dimensions and value. Several other lodes in the mine which, according to the testimony of several others, fully capable of forming a pretty correct estimate, will produce to the ton of leatostuff, or, in Cornish phraseology, 10 cwt. of tin to "work." This, I need hardly say, is an exceptionally good yield. The mine should either be worked or wound-up voluntarily, and in either case a meeting of the company is required for sanction. When gentlemen become directors of any company they should do their duty to it.

*Truro*, Feb. 4.

## VALUABLE SLATE AND OTHER QUARRIES.

SIR.—I suppose that one of the best, if not the best, slate quarry in Great Britain is that belonging to Mr. Thomas Harvey, of St. Clement's House, London. I inspected the specimen slates there last week, and was astonished to find the quality so good. I was not aware that slate had been found anywhere of that quality. Its cleavage property is so good that it can be divided into sheets as thin as coarse brown paper, and as smooth nearly as planed wood, and in perfect planes. I was also astonished at the *ferule* quality which the slates contain: they can be bent considerably without breaking.

I saw also in Mr. Harvey's offices samples of lithographic stone brought from his estate in Canada, of 150 acres, underlaid by the best rock of this kind. I saw some copies from a drawing on one of the stones, and found it superior to that produced from a German stone. There is a store on that estate sufficient to supply the world for a long period. As Mr. Harvey has so many things in hand, I believe that he intends to sell this property.

*Plumbago* of good quality abounds in some large estate in Canada lately taken by Mr. Harvey. The quality the best I ever saw, and the quantity is said to be unlimited. —Feb. 3.

R. SYMONS.

## EAST TERRAS MINING COMPANY.

SIR.—I have been for months pressing the secretary of this mine to call a meeting of the shareholders, but have not yet succeeded. He informed me that he cannot get the directors to meet: when one can attend the other cannot, or will not; and without their meeting to elect another director it appears that no legal notice can be given. According to the Articles of Association a meeting is now due, and I believe a penalty attaches to the omission of a yearly meeting of the company. The mine should either be worked or wound-up voluntarily, and in either case a meeting of the company is required for sanction. When gentlemen become directors of any company they should do their duty to it.

*Truro*, Feb. 4.

## WHEAL WHISPER TIN AND COPPER MINING COMPANY.

SIR.—In answer to the letter of your correspondent, in the Supplement to last week's Journal, I would first ask him simply what the capital of a company has to do with the value of its assets, and how he applies it—say, for instance, to Mineral Hill, or to Devon Consols?

The reserves of ore in Wheal Whisper, not in sight only but at surface, have been valued at over 30,000/-, the run of 50 stamps with all driving machinery and dressing floors would be by many valued at an additional 10,000/-, and the power to drive that machinery, with as much more added to it, free of cost as far as coal is concerned, if not an asset can at least in such times as these be called a valuable acquisition. In the profit and loss account for the year the sum of 570/- was deducted from total cost, that amount having been expended on machinery and such work as can never occur again, and the profits from which will accrue in future years. I can scarcely believe that the letter emanated from "A Shareholder's Pooker," but if so it would be well known, I think, in as good taste to have kept it there, and by attending the meeting he could have suggested a form of account more suited to his taste. If, on the other hand, it is simply the growl of a bear's object is perfectly intelligible. —*Portuguese-street*, Feb. 5.

R. LARCHIN, Secretary.

## EAST LLANGYNOG LEAD MINE.

SIR.—In the Journal of Jan. 25 is a paragraph announcing a "very important discovery in this mine." As there was no confirmation of this in your of Feb. 1, I take it to be somewhat questionable. It is, however, high time we began to look ahead, for if even a class of shareholders were treated with contumely, those of East Llangynogare. We cannot depend on a report in the *Mining Journal* within any stated or reasonable time, and all reasonable information respecting the mine is withheld. Now, this is a state of things that should not exist, and I would advise the shareholders at once to take action.

A BONA FIDE SHAREHOLDER.

*London*, Feb. 6.

## THE ST. STEPHEN'S TIN AND COPPER MINES, ST. AUSTELL.

SIR.—I observe that you make mention in last week's Journal of this great mining property, which I understand comprehends the Great Dowgas Mine, Down Tonement, Wheal Orchard, and last, though not least, the famous old Wheal Strawberry concerning which reports have long been current in the district to the effect that when formerly worked (some 40 years ago) one of the lodes produced tin ore containing even as much as 1500 lbs. of tin per ton. These stories, although emanating from respectable men, have, not unnaturally, regarded as "old miners' yarns," but I have been told by a gentleman of high standing, who has just returned from St. Austell, that he saw on the mine large blocks, weighing some cwt. of rich tin ore which the mining agent, Capt. Nicholls, pronounced to be the very finest stones of tin he had ever seen, and that the present produce of the lode averaged from 45 lbs. to 50 lbs. of tin per ton!

Some of these large blocks of tin are now on their way to London, and are, I believe, to be exhibited on arrival. They are expected to show a very high percentage of tin, and I am sure that you, Mr. Editor, and everyone who has the mining interests of England at heart, will view with unfeigned pleasure these material proofs that Cornwall, and St. Austell in particular, can hold its own against the world in this ancient product of Britain. Should these blocks of ore assay as rich as is expected, it will go far to demonstrate that the "old miners' yarns" are really founded on fact. It is an important feature that this rich ore, which is now being sent to grass, is taken from the 30 fm. level, 15 fm. above the deep adit, and which is quite dry.

My informant is under the conviction that Wheal Strawberry is destined to astonish the mining community more now than it did 40 years ago: and being under the management of so able a man as Capt. John Nicholls, no doubt can exist as to these mines having every justice done them.

CASSIMBRIDGES.

## MINERAL HILL MINES.

SIR.—I am glad to learn by last week's Journal that these mines made a profit of 10,000/- since June last, and that there is a prospect of further improvement. I stated in my letter (see Journal of Jan. 11) "We had received back some 25,000/- for interest and principal." This was a clerical error of mine; I intended to have said 25,250/- Had we been furnished with a later balance sheet I should not have been guilty of omitting the interest paid on the remaining 297,000/- Debenture Bonds to Sept. 29, 1872—say, 25,412/- More. I certainly admit that the directors intimated they were going to pay 240,000/- for these mines, but I never for a moment dreamt that the directors, without our consent, could (or would try to) convert us from holders of "First Mortgage Bonds" (bearing a fixed rate of interest, with a return of the principal—and with a bonus promised—at the end of three years) into shareholders. You say the total value of silver sold is not far short of 500,000/- You also say: "The ore in the dump piles realised the value put on them by Mr. John Taylor, jun., which is set down at 41,000/- Now, I should much like to know how much of the 45,135/- lbs. 3d. (see balance sheet, April 9 to Dec. 31, 1871) was spent in returning charges for the latter, and for the residue of the 45,135/- lbs. 3d. how much new ore ground was discovered?" Again, I should like to know how much new ore was discovered for the 49,254/- lbs. 3d. charged in profit and loss account from Jan. 1 to June 30, 1872. Again, I should like to know what the costs have been from July 1 to Dec. 31, 1872. Again, I should like to know how much ore ground was discovered for this money. I am sure, Sir, that if any person competent will, in the Journal of Feb. 15, answer these questions, the same will be read by my fellow shareholders with whom I have no greater interest than by G. W. B.

A DISAPPOINTED SHAREHOLDER.

*London*, Feb. 6.

## UTAH SILVER MINING COMPANY, AND FURTHER CAPITAL.

SIR.—As one deeply interested, I wish to ask my fellow shareholders if they are not making a great mistake in allowing their property to pass into the hands of a few men under the form of mortgage bonds for the paltry sum of 10,000/- The fallacy of such a proceeding will appear the more evident when it is understood that the sum of 70,000/- is due as the old indebtedness, and that from 250/- to 300/- each month of additional indebtedness is being incurred at the mines, which by the time the 10,000/- is raised will bring the total debt up to between 80,000/- and 90,000/- leaving but from 10,000/- to 15,000/- as the working capital to be used the proposed dressing floors. Now, there is unmistakably some design other than the welfare of the mass of the shareholders when the directors, who a short time ago would not be contented with less than 28,000/- new capital, now come down to a sum which will only render temporary relief, leaving the company in a crippled condition. The directors do seem exceeding anxious that this inadequate sum should be raised, using much plausible argument, and smoothing things over before the shareholders. Mr. Applegarth assures them there is \$10,000 worth of carbonate ore at the mine which can at once be sold for cash, and Mr. Batters says there is little or no expense going on at the mines, while I understand from good authority there is not one third the amount of carbonate ore at the mines claimed by Mr. Applegarth, and that the amount above named of about 300/- each month being incurred at the mines. For my part, I have no faith in the plan adopted by the committee and directors of encumbering the property for an amount which is wholly insufficient. The only plan, in my opinion, which would be found at once both safe for the shareholders and equal to the emergency is the issuing of 14,000 additional shares, bring share for share with the old capital stock, at 2/- per share, calling in £1. each at once, and the balance as it may be required from time to time, the probability being that the first 14,000/- or 1/- per share, would be enough to carry out the full plan of dressing the ore, &c. But in any case the 10,000/- will not be enough, and I most positively assert, from what I learned from shareholders with whom I have conversed on the subject, that this fact—the insufficiency of the amount asked for, coupled with the uncertainty as to future management—has deterred the shareholders from coming forward, believing that when the 10,000/- is raised, and the debt paid, there being then no working capital, the property will fall into the hands of the holders of the proposed bonds.

Therefore, I would say to all the Utah shareholders come forward on Feb. 12, and make up your minds to demand that 14,000 new shares shall be issued, take each his proportion, see that your property is at once saved, and that sufficient means is provided to deal with the property in the future, according to the plan laid down in Mr. Murphy's report.

UTAH SHAREHOLDER.

*London*, Feb. 6.

## UTAH SILVER MINING COMPANY.

SIR.—It is not my intention to waste my time in replying to Mr. Murphy's incoherent and rambling statements, published in last week's Journal; they will carry their own condemnation. It may be desirable, however, to notice one or two points. The report of Mr. Murphy, from which I quoted, was handed to me as one of the original shareholders in the company at the time of its formation, weeks before Mr. Sewell was called in to report, and I candidly admit that when I heard of Mr. Murphy's appointment in January, 1873, I was sanguine enough to believe that his presumed knowledge of the property would soon brighten the gloomy condition of the company's affairs. As a shareholder simply, and knowing nothing of the company's operations, except from the published reports and from such private information as I received from Mr. Sewell, I cannot be supposed to be responsible for the acts of the then directors or of their managing superintendent in Utah, as to the number, position, or capacity of the furnaces. The capacity of this singular furnace has never shown itself. I cannot trace any record of its true capacity. It has been stated to be of 10 tons, then 40 tons—perhaps after all it may be only 20 tons per diem. Whatever its size, a furnace adapted for smelting the carbonate ores represented by Mr. Murphy to be existing in such large quantities in 1871, and of which samples were forwarded to London, would not be suited for smelting such ores as now exist in the Red Warrior lode. The shareholders in this company, however, will not allow themselves to be deterred from subscribing to their property, in consequence of the disastrous smelting failures of their late superintendent.

Recent letters from Mr. Eagle, the company's resident secretary in Utah, show too clearly that the late superintendent if unfitted as a smelter is still more so as a financial manager. Mr. Sewell wrote his letters direct to you, Sir, as Editor of the *Mining Journal*, and you could have informed Mr. Murphy, had he taken the trouble to enquire, that he never passed through my hands at all. Mr. Sewell within the last three months has purchased 100 shares in the company, and has telegraphed to me this day that he will subscribe for 100/- of the debentures. I leave the shareholders to judge for themselves from these facts as to Mr. Sewell's opinion of the future prospects of the Utah Silver Mining Company.

FREDERICK BENNETT.

## NORTH AMERICAN GOLD MINING COMPANY.

SIR.—It is bad enough to have been left in ignorance for many months of every thing relating to the mine and its management by our directors; but it is, if possible, worse to be reproached with that ignorance thus unjustifiably imposed. Our Chairman was aware, when he wrote the letter which appeared in the *Journal* of Saturday last, that his co-directors had not given publicity to so much as one line from the superintendent at the mine from December, 1871, to October last, but pre-served during the whole of that period the utmost secrecy regarding it. In saying, therefore, that "all reasonable publicity ought to be given to the report of the superintendent," he virtually condemns the reticence of his co-directors, and acquits them of anything more serious than involuntary ignorance of the great merits of "North America."

I believe, however, that it is not my imputed ignorance that is so distasteful to our Chairman, but my "impertinence" in exposing in the *Journal* the untruthful reports, as judged by the results, of Messrs. Degroot and Morgan; the promises in the prospectus as fulfilful: the systematic suppression by the directors of Mr. Morgan's reports from the mine; the fabulous sum of 9000/- sent to him for expenses, when we had been led to believe the mine was being worked at a profit, &c. It is my having directed attention to these and other kindred matters in the *Journal* that is "the head and front of my offending," and appears to have somewhat disturbed the equanimity of our Chairman.

It is a mere mockery to tell shareholders, some of whom reside in Ireland, Scotland, and distant parts of England, that they could have got the information they wanted "if they would call at the office." It was the duty of the directors to communicate to them all the information they possessed through the daily papers, instead of systematically suppressing it, as they did, to the great prejudice of the shareholders. Our Chairman affirms that the shareholders are themselves responsible for the purchase of the mine; and this may be true so far, but it is not the whole truth, and he ought in common fairness to have added that they were induced to purchase the mine by the strong representations of its value made by the late Chairman and other directors at the meeting on Dec. 4, 1871. The shareholders, as our present Chairman knows, belong to a class in which are clergymen, army and navy officers, doctors, clerks in public offices, spinster, &c., who, knowing nothing themselves of the merits of a mining property, are guided by directors whom they believe to be well informed about it, and honest men. When, therefore, they were assured by a gentleman of Mr. Toombs's position that the concern had been before the board for many months, and Mr. Maclean's report for ten days, and that it was their unanimous opinion that the property was a valuable one, and would pay well, the shareholders might be expected, to purchase it. The report is well known, and I will not here repeat it, but the shareholders are indignant and discontented at the treatment they have received.

We are told, however, that we shall have a dividend shortly, as it is not improbable that it shall be a portion of the 9000/- of our property recently sent to Mr. Morgan, will be returned. A poor performance this, after the promises officially made by Messrs. Degroot and Morgan, of 65,000/- certain, or Mr. Hughes's modest estimate of 40,000/- minimum. Indeed, I hardly think, notwithstanding the promised dividend, that the mine will have paid off for the year, and it would be satisfactory to the shareholders to be furnished with a copy of Mr. Morgan's accounts, which had not arrived in time for the meeting last month, giving the details of the expenditure of the item of 9000/-

Finally, may we hope from the due publication of some recent news from the mine that at last there is an end to the system of secrecy and mystification which has hitherto prevailed respecting our property?

A SHAREHOLDER IN "NORTH AMERICA."

## THE EMMA MINE, AND ITS MANAGEMENT.

SIR.—I have a considerable interest in the Emma Mine, and desire, with your permission, to express, in conjunction with several late correspondents, my extreme dissatisfaction at the manner in which our property has been superintended. I have hitherto looked upon the directors as worthy of our confidence; but whether that confidence has been abused or not time alone can show, while it is sincerely to be hoped that the shareholders at the ensuing meeting will not submit to have what "Another Shareholder" designates "dust thrown in their eyes," but will be unanimous in their determination to "see what the directors are about," and if necessary will elect "good practical men" to look after their interests. As I fear I shall not be able to attend the general meeting of shareholders, I desire here to record that, in a conversation held with a gentleman who is part proprietor of a mine in Utah, he informed me he had been all over the Emma—that if 500 tons were raised per diem, it would take more than five years to clear out the ore—and that, in his opinion, "the mine was very badly managed." The cessation of the monthly dividends would seem to lend strength to this opinion of mismanagement.

In the Chairman's letter of Dec. 10 he says—"The last thing I did was to arrange for a more powerful pump. Last year we had no pump at all." Every shareholder knows the fatal consequences of this neglect. I make no comment upon it, but simply ask of those competent to answer—Can this be deemed good management? Is it good management to suffer things to take their chance, and, to use the vulgar phrase, "look the stable door when the horse is stolen." In the early career of the Emma some of the directors, I believe, held a large number of shares, but the few now retained by them would seem to indicate a diminished affection for the mine, in spite of the Chairman's statements that "arrangements have been made for getting out ore in larger quantities." It cannot be gratifying to the shareholders when they think how these assertions have been verified. With a greatly diminished output, and no dividends, it is but justice to the shareholders that a reduction should be made in the expensive management of the undertaking. I opine that the number of shares held by directors in mines need not, of necessity, be large, but I think it would be better for the shareholders if they were precluded from speculating in them. —London, Feb. 4.

A DISAPPOINTED SHAREHOLDER.

*London*, Feb. 6.

## ALMADA AND TIRITO MINING COMPANY.

SIR.—You did me the favour to publish a letter on or about Aug. 28 respecting the above company, in which I called attention to its then prosperous condition. There were other letters besides, and a very proper one from the Chairman about this time, giving every information to the shareholders or anyone else who might take advantage of the *bona fide* remarks therein contained. I should not now address you on the subject, except for a letter which appeared in last Saturday's *Money Market Review*, signed "A Shareholder," upon the same subject—the depressed condition of the shares. He says that "the low price of the shares contrasts strangely with this respectably conducted company." It appears to me that its "respectability" did not prevent the shares falling 50 per cent. below what they were 18 months before, when they were at 25 per cent. prem., the mine being infinitely better in its position and prospects when it was in its most depressed condition, and, therefore, "respectable" management, so called, is beside the mark. "Sarey Gamp and Betsey Prig" managed their little affairs very "respectably," and so do the directors of the Bank of England, though in their time they have been called most respectable old ladies.

If, however, "respectable" is to have anything to do with it, it is evidently going to be a very "respectable" concern indeed, for almost ever since the middle of last year the monthly profit has been ranging between 1800/- and 2000/-, and, therefore, the profits alone must ultimately tell upon the value of the shares, let alone the prospects, which I understand are daily, or rather monthly, improving.

I have no doubt "A Shareholder" knows a good deal about the concern, and like others who have held shares, as I have done, from the commencement of the company, am disappointed that the mine has not made quicker returns; and in attempting to do good, in order to enlighten his brother shareholders, has left them, I think, rather in a fog, or put the case in the right way: and, though I do not pretend to be behind the scenes. "A Shareholder" may have no objection, perhaps, to a brother shareholder partly making use of his figures:

It would appear, then, that the company have bills of lading for 155 tons

of ore, which, taken at 50/- per ton, would produce 7750 0 0

And that besides this there is a remittance on its way for ore sold in the country, which leaves a net profit of 1571 0 0

To this must be added the profit arising from an under estimate made on 41 tons of ore sold, ex Dorothea 653 0 0

Making together 2992 0 0

So that with what the directors may have in hand, and that which is evidently afloat and in bills, it is to be hoped that the next dividend will be, as "A Shareholder" surmises, at least 50 per cent. above the last, which is at 19 per cent.; and should the estimate be favourable on the 155 tons aforesaid on its way to England as by that the Dorothea, there would be upwards of 2000/- more to add to the company's assets. Having been a miner for 40 years, both foreign and domestic, I have made up my mind as to the future of Almada and Tirito, but I keep that to myself. I am sick and tired of recommending. If masters go badly, you get soundly abus'd; if they go "all right," you obtain no thanks even from your best friends, and, therefore, I give no opinion, only that the present position of the company speaks for itself. —London, Jan. 30.

A. B. C.

(For remainder of Original Correspondence see to-day's Journal.)

GOLD MINING AND MILLING OF GILPIN COUNTY,  
COLORADO, UNITED STATES—No. I.

In the January number of the "Quarterly Journal of Science" Mr. James Douglas, of Quebec, Canada, contributes an interesting article under the above heading. The acceptance and publication in a Journal of such high repute is an endorsement of the author as well as of the article itself, hence the facts stated are entitled to the fullest confidence. Of Gilpin County this writer says—"Within an area whose centre is Central City and radius 1½ miles, was discovered before 1863 a gold-bearing lode at almost every hundred feet, and many of these lodes were yielding gold and matter for exaggeration so abundantly that American brokers in the cities of the East were enabled to form no less than 150 public mining companies. It is then said that mills were built by these companies which failed to be profitable after the surface ore were exhausted; yet, notwithstanding this fact, "a few mines, rich enough to bear the loss of from three-quarters to two-fifths of their produce in the mill, have remained open to testify to the extraordinary richness of the district." The presence of these mills, representing capital and power, caused them to be used despite of the waste, but it is also remarked that "unless some better system be introduced mining must languish, for no mines can long sustain such waste." Mr. Douglas then states the purpose he has in view—"The present article is a contribution towards the solution of the question, which, as it involves a saving or loss of several million dollars worth annually of gold, silver, and copper, is well worthy the attention of metallurgists. So abundant is the ore that were mining conducted systematically, and the product of the mines utilised, Gilpin County would probably yield more value in mineral than any district of equal size in the world." This statement is as true as it is extraordinary. Gilpin County has no parallel in the history of mining, neither in the number, variety, richness, and local proximity of gold-bearing lodes, nor in the fatal errors originally made and perpetuated by a continuance in this compulsory system of treatment. Since 1865 not less than \$1,500,000 to \$2,000,000 have been washed down to the plains yearly by the water flowing through its crushing-mills, gold, silver, and copper inclusive. It is proposed in this paper to add to the facts so ably presented by Mr. Douglas, from sources of information not readily in his control; and in doing this free quotations will be made from the "Journal of Science."

During 1864 and 1865 there were 195 companies organised in the East, 121 of which were located in New York City. Of these 142 companies had a capital of \$126,351,420. All of them, perhaps, had over \$1,600,000 (the capital of some not being stated in the list). Not less than 10 per cent. of this last amount was actually expended in purchase, in contracts for machinery, in transportation in construction and development. By 1865 nearly all of these combinations had ceased operations. Some had failed, all were discouraged. The mills, costing vast sums of money, delivered there for 120¢ per ton freight, deliverable now for 20¢ per ton, had failed to treat the sulphurated ones. The mines were not in fault. Ore from one mine, which had produced from \$20 to \$60 per ton when this metal was reached, failed to yield enough to pay milling expenses; yet the assay value had not changed. Nor were the owners in fault, excepting, perhaps, for the concealment of this difficulty. They made their representations on the yield of the oxidised rock, free gold rock, such as in California and in Australia, but rarer. Nothing was said of the virgin undecomposed sulphurites which had been treated previously to 1863. The companies shipped California mills; these mills tailed on this ore, millions of money were abandoned in these properties, or more money was expended in the fruitless attempt at the introduction of empirical processes. Thousands of eastern men who had been seduced by golden promises, lost heavily, and became prejudiced against Colorado, infecting others with a like hostility. The collapse was nearly as rapid as was the inflation. Colorado lost credit, fame, and the confidence of the people abroad. The residents of Gilpin County were left to themselves with millions of capital invested in machinery now silent and abandoned. The recovery was slow. Here a mine was leased, or a new one worked, there a mill was started up; necessity called up activity. Shut off from the confidence of capitalists, nothing new could be attempted. The people must learn to use what was on hand, and they have done so. During these six years the shipment of bullion has slowly augmented, notwithstanding the severe losses sustained by working the mills, until it reached yearly \$2,000,000, including the shipment of mite. This from an extremely small area, in which nearly all of the most reputable mines have remained unworked. In this time the material progress of the Territory has been truly wonderful, based as it has been entirely on the mineral wealth of the mountain ranges. Cities have sprung into existence, and every requirement of modern civilisation is now to be found, where 12 years since the Indian and the buffalo occupied the soil, fully 60 miles west of the extreme verge of civilisation. 400 miles of railroad have been constructed, and are in profitable operation. Central City can now be reached entirely by rail from the Atlantic in four days, or from the Pacific in three days; 300 miles of road are projected, to be finished within another year.

In addition to the errors in methods of reduction, Mr. Douglas gives prominence to two other causes, both prolific of discredit to the mines of Gilpin County, when all the discredit should attach to the owners of the mines. One, the subdivision of lodes; as, for instance, on the Burroughs 2247 ft. are owned by seventeen proprietors, two owning as low as 20 ft., each, one 40 ft., one 50 ft., and the largest 462 ft. On these properties there are 15 shafts, the deepest 560 ft., the shallowest 30 ft.—an aggregate of 2804 ft. This is but a sample of the ownership of very many of the most important properties, quintupling the cost of development, and doubling or trebling the cost per ton of ore raised to the surface. The other cause of discredit exists in the fact that the local agents of dead companies lease the companies' mines to contractors, who, without other capital than their labour, enter into property upon which many thousands have been expended, and with the least possible outlay extract all the ore which may be reached. Millions have thus been extracted, and such mines left in a condition which will require almost millions to put them in safe working order when again opened.

Mr. Douglas observes that the country rock is granitic, with some gneissic varieties. In this respect there is, of course, no room for a difference of opinion. Every mining expert has given his testimony to the existence here of "true fissure veins, the walls usually distinct, and marked often with well polished slicksides. A clay sewage, then a band of almost pure iron and copper pyrites, intermixed with small quantities of blende and galena, or of blende and galena alone, or of all these sulphurites mixed in almost equal proportions, occurs on one or both sides, while the centre of the lode is composed (where the lode is rich) of a gangue of decomposed quartz or felspar, carrying more or less of the same sulphurites." The average width of the really productive lodes may be set down at 3 ft., but they are all subject to contractions and expansions, sometimes pinching to a mere thread, at other times bulging into enormous bunches." When the Territorial Assay Office was established it was required that all persons bringing samples to the office should state the depth and width of crevices from which the sample was taken. According to 108 statements of this kind during two years, made for the Gregory district, among which 1 ft. is the lowest and 8 ft. the highest, the average is slightly over 4 ft. Calculations made for other districts or subdivisions will fully sustain this as a safe standard for the width of the crevice in Gilpin County.

Mr. Albert Reicheneker, an educated German metallurgist, made a searching investigation into the value of Gilpin County ores, and the losses incurred in the mill treatment. Use has been made of his valuable conclusions by Mr. Douglas. The division of ore into first and second class, and the classing of the mine into the best and the poorest, are also retained and quoted:—Value of first-class ore (smelting ore), \$134.50; value of mill ore (second-class) from best mines, \$41.42; value of mill ore (second-class) from poorest mines, \$30.

An investigation of the official records of assays made during two years, and also those of a private office for a like period, taking all assays made, the very lowest as well as the highest, made for every variety of purpose, but mainly for prospecting assays as a guide in the active working of the mine, will sustain the conclusions reached by Mr. Reicheneker entirely by another method:—

District.	No. of Assays.	Gold.	Silver.
Gregory district	129	25.12	9.03 per ton.
Nevada	135	26.55	12.67 "
Illinois Central	39	26.08	19.06 "
Russell	34	19.13	22.12 "
Central City	20	22.69	19.53 "
Eureka	20	27.78	15.16 "
Average value of mill ore by 415 assays	\$40.66 per ton.		
Gregory district	106	143.91	24.58 "
Nevada	64	92.90	29.54 "
Illinois Central	12	119.63	35.53 "
Russell	20	82.85	42.13 "
Average value of first-class or smelting ore by 202 assays, sampled and sold	\$143.75.		

An approximation for an average value is all that can be expected. These values, being reached by very different modes, establish a sound standard in regard to both classes of ores. By the same source of data it is shown that mill tailings, 163 assays, average \$22.91. These samples represent many thousands of tons in piles, tailings made by the active milling of ores for two years. These assays of samples were made from 282 lodes, the average length of which Mr. Douglas states to be about 4000 ft., hence 1,129,000 ft. of mineral lodes actually assayed, from which, as Mr. Douglas remarks, "Gilpin County could probably yield more value in mineral than any district of equal size in the world." And "from mines now open 1900 tons a-day of \$20 ore could at once be produced; and there are second-class mines innumerable, which, under existing modes of treatment, are valueless and closed which would quadruple that yield if it were shown that a \$20 ore could be mined to a profit."

Battery amalgamation and tailing concentration receive attention at the hands of Mr. Douglas. The following is one of the very best and most characteristic examples of battery amalgamation, or result of mill treatment. The statement is entitled to full credence:—

Treated by stamp mill..... 250.00 tons.  
Sold to smelting works..... 13.27 "

Mill ore assayed per ton, gold..... 25.13 Silver 1.94 = \$ 27.07  
Smelting ore assayed per ton, gold..... 131.21 16.22 = 147.43  
Assay value of all ore raised, per ton

Average yield per ton in currency, mill ore..... 12.63  
Ditto ditto smelters' ore..... 11.07  
Ditto ditto all ore raised..... 14.17  
Gold reckoned at 120 premium, mill ore yielded..... 40 per cent.  
By sale, smelters' ore..... 62

The whole value of the ore..... \$24,965.76  
The absolute loss by milling..... 12,693.33

In regard to milling and then concentrating the tailings, the following statement and calculations may be made, showing that under the very best system of milling, attention being given to saving, and then concentrating the tailings, a loss of 40 per cent. and over is almost inevitable.

The Relation of Silver to Gold.—This relation was unnoticed until attention was directed to its importance by the writer. As an alloy, silver is never absent, but until these ores were handled mines producing gold ores seldom or never produced the sulphide of silver in appreciable quantities. Such ores are unknown in California, and no mention is made of the sulphide of silver existing in the gold-bearing rocks of Australia. Nor is the presence of copper notable in either of these regions, whereas in the Gilpin County auriferous veins, the sulphide of silver, is an important element of value, as is also the sulphide of copper. It is, perhaps, sufficiently curious to remark that this sulphide of silver accompanies the mineral when distributed throughout the gangue (in mill ore) to a greater extent than it exists in the solid pyrites (smelting ore) from the same vein, as will be seen from the following figures:—In 428 assays, including all ores but the solid pyrites removed for smelting, \$77.65 in silver to the \$100 of gold. In 75 assays of samples, only the

very poorest removed for milling, perhaps 40 tons of the 100 tons, \$70.84 in silver to the \$100 in gold. In 216 assays of smelting ore, solid pyrites being only about 5 per cent. of the ores, \$34.26 in silver to the \$100 in gold. The loss of silver is presented very strongly when the average of the first and second (506) assays is taken—viz., \$74 in silver to every \$100 in gold.

In the bullion from amalgamation there is about \$20 in silver to \$100 in gold; that is, all the silver obtained with the gold in the battery amalgamation is in the native alloyage. It is a remarkable fact that the average of this native alloyage in the world is about \$21 in silver to \$100 in gold. Hence, then, of \$74 the mill saves only \$20 in silver; the balance is lost as an alloy with the gold lost, and as a sulphide of silver. A large portion of that \$54 in silver is a total loss, not stopped in the pile of tailings, but, being held in suspension, flows away with the muddy water. The streams show this far away from the mills, the water of which being taken near the surface and settled. The settling upon being assayed show a notable presence of silver without a trace of gold. The next loss of silver takes place when the pile of tailings is budded. 220 assays of tailings (samples from piles containing many thousand tons) showed \$25.43 in silver to \$100 in gold.

The loss, then, is \$20 + \$25.43 = \$45.43 saved out of \$74 = a loss in the flow of \$28.57 in the \$100 of gold. And now when budded this relation again changes. In the concentrated there is by 132 assays \$17.51 instead of \$25.43 in silver to the \$100 in gold, hence a loss of \$7.92 in silver to the \$100 in gold in the flow from the buddle. These two losses, then, sum up \$28.57 + \$7.92 = \$36.49 lost in silver for \$100 in gold contained in the ore, or very nearly 50 per cent. of the silver.

*Loss of Gold by Milling.*

This loss occurs—1. By reason of the sulphates present in the water, which change blue litmus into red, the strength of the solution being increased by piles of old tailings decomposing, and by being run through successive mills in contact with ores in which there is more or less sulphate. Such water cuts up the mercury, helps to coat the gold, whilst corrupting the mercury, and so prevents amalgamation.—2. By escaping particles of sulphates enclosing atoms of gold, which if not finally caught in the concentrators are wholly lost. A calculation to the above will show that the loss of gold under the best system of management is about 33 per cent., which, added to the 50 per cent. loss of silver, puts the result in this shape:—

Loss of gold in \$100 .....	\$33.00
Loss of silver in \$74 .....	37.00

Hence a loss out of \$174 of \$70, or over 40 per cent. The loss on one-half of these ores milled in Gilpin County during the last five years was fully 60 per cent. of the contained value of the precious metals, and all the copper, not saved in the smelting ore, no effort being made to save the tailings of this mill. It is, therefore, a safe conclusion that fully one-half of the value of the Gilpin County ores is absolutely lost to the commerce of the world in consequence of a defective system in treatment. Mr. Raymond, United States Commissioner of Mining Statistics, reports 100,000 tons reduced in Gilpin County in 1869 to—

Estimate this ore at \$35 per ton, smelting ore included .....	\$3,500,000
Out of which 5000 smelting ore at \$100 .....	500,000

Value of milling ore .....	\$3,000,000
Of which 50 per cent. is lost .....	1,500,000
Add for copper lost (Mr. Douglas) .....	450,000

Loss in one year on 100,000 tons .....

[To be continued in next week's Journal.]

PATENT CONDENSED PEAT FUEL.

H. CLAYTON, SON, AND HOWLETT'S PATENT.

Referring to the Supplement of the *Mining Journal* of Jan. 11, under the above heading, after noticing a promising experiment made with a working model, the reader was informed that a full-size machine was being made by the patentees—the Messrs. H. CLAYTON, SON, and HOWLETT, of the Atlas Works, London, W. We have now to report a successful experiment, on Tuesday, by this machine in the presence of some 50 gentlemen, specially invited to see its performance, and test its productive merits (some of them on their own peat) in any manner they might see fit. The owners of peat bog were well represented, and it was highly interesting to hear them and their representatives arguing the question from their own point of view against some who thought they ought to be thankful if they only could get rid of their bogs on any terms, as the land thus reclaimed would be worth some 30¢ more money per acre. And what rendered the question raised as to the landowners' royalty on dry peat (6d. per ton as it was practically stated, 20s. per ton being the market price) doubly interesting is the fact that on the day of the experiment coals in the metropolis rose 8s. per ton. Had this advance in the price of coal been expressed at the meeting it would certainly have affected in no small degree the commercial balance, turning the scales in favour of landowners. But be this as it may, the advance proves beyond a doubt that the present time is a most favourable one for the investment of capital in this new and promising branch of industry. There are many landowners who are highly intelligent business men, capable of turning their peat bogs to better account than any private company, and who will not be scared from a sense of duty by hypothetical calculation, as the work can be contracted for at so much per ton. On the other hand, there are doubtless many exceptions whose safe course of action need not be pointed out.

The experiments made were with raw peat from St. Ives, Huntingdonshire. Much of the vegetable matter was very little broken, but rather in an advanced stage of decomposition, and in passing through the machine it was thoroughly reduced to an homogeneous pulp. The machine was driven by a portable engine, but not over 4-horse power was expended. It must be borne in mind, however, that the experiment was exclusively confined to the masticating, pulping, and expressing of the peat—the two ends of the practice, so to speak, being wanting—the hauling of the squeezing trucks from the bog at the feeding, and the actuating by mechanical means the discharging apparatus, so that 2-horse power will be required to work these in the bog; or a 10-horse engine will drive two machines, or a 20-horse engine four machines, where bogs, or rather bottoms, will carry such weights, as such combinations would greatly economise labour, machinery, and plant; but into such details it would be premature to go at present, as each bog, moss, or fen will have its own requirements.

The construction and performance of the masticating, pulping, and expressing machine was highly admired by the meeting, and unanimously pronounced a complete success. Its general mechanism closely resembles in character that class of machinery (brick and tile) for the successful manufacture of which H. Clayton, Son, and Howlett have long been acknowledged pre-eminent. It consists of two conjoined cylinders, the one vertical and the other horizontal. The former has a feeding-hopper, and the latter three discharging dies,  $3\frac{1}{2}$  by  $2\frac{1}{2}$  in. In each cylinder a shaft armed with peculiar masticating and pulping apparatus rotates, being driven from without by bevel and spur-gear. The blades of the vertical shaft form portions of a screw, and work the peat downwards into the feeding screw-mouth of the horizontal cylinder as they masticate and cut it up. Between the two chambers provision is made for "screening" out stones when present in peat. This is a capital contrivance, as stones would play much mischief with the more closely set pulping discs and blades in the horizontal chamber. Such forms the body of the machine. The feeding-screws work forward the peat into this chamber, on the shaft of which a series of discs are so arranged as to form a double cutting screw throughout its whole length. Hardened steel cutting blades are also arranged that the revolving discs pass between them, by which the peat is gradually propelled forward, and the chamber kept uniformly packed, so as the better to effect the minute subdivision of the whole mass. By the time it arrives at the discharging screw the peat is not only mechanically changed in character, but it also loses the powerful affinity for water which all decayed vegetable matter possesses, so that we are apprehensive some chemical change must take place in its constitution favourable to the process of drying and burning subsequently noticed.

The discharging screw forces the thoroughly prepared peat through the dies or orifices in three continuous streams on to rollers, which carry it forward to the drying trays. Below is another set of rollers which carry the trays to the cutting wires, which cut up the peat into briquettes 5 inches in length, as in cutting bricks. The trays are made of lath, and are light and easily handled, and each holds 21 "peats," seven in a stream. The empty tray is put in below the upper rollers, and rests upon the lower ones, and extends sufficiently far beyond the former, so that the moulded stream of peat lays hold of it and pushes it forward; the moment the stream reaches the tray it is cut off by a single wire, and as soon as the tray receives its load, an empty one is pushed in to catch the flowing stream of moulded peat. When the tray passes the cutting wires it is moved onward down the inclined tramway to the drying rack, into which it is placed. In about three days the moulded peat will be sufficiently dry to be removed from the trays and stacked in drying sheds to complete the drying.

As the peat dries it gradually decreases in bulk, until it finally becomes nearly as compact as coal, and of about the same specific gravity. In this state it remains and will not absorb moisture as

unpulped peat dried in the ordinary way does. This great affinity for water as it had when in the bog, has lost this affinity, as already stated. This is an peculiarity of the patent condensed peat that requires to investigate it than we can give in this report, and we doubly interesting to the mining world.

The machine was timed for short trials, the moulded weight fully weighed, and the calculations made showed that to charge 75 tons of moulded peat in a day of ten hours prior experiments made at the Atlas Works, 75 tons will yield 15 tons of dry peat, and Mr. Elms, who has considerable experience in the manufacture of peat in Wales, assisted the Messrs. H. Clayton and Co., to explain to models and drawings of drying-sheds, plant, &c., calculate capital of £2000, will start the whole affair to turn out condensed peat daily.

Of the efficiency and purity of condensed peat in coal the chemical analyses hitherto made are in favour of But we would command a more searching investigation of peat and its properties for smelting and other purposes. Condensed peat was kept burning to show visitors its heat and purity for household purposes, and the general opinion was in the highest degree favourable. A supply of coal made under H. Clayton and Co.'s patent will soon be available. The present high price of coal will induce all who require it to buy a hearty welcome. For smelting and like purposes some bogs may yield a more valuable article than others. Owners of peat bog should test the purity of their peat depths, to ascertain which is the best market for it. An only to be turned to such facts to determine their import country where so much coal is consumed in the arts and menses areas of peat exist, extending over some 6,000,000 peat averaging in depth from 3 to 40 feet. Landowner depth of their own bogs, and, as from the above expense of wet peat yields 1 ton of dry, the calculation is easy much they can send to market. But they must bear Sir Humphry Davy says—"A soil covered with peat is not only with fuel but also with manure"—i.e., a sufficient of peat should be left at the bottom for mixing with the claimed soil.

THE NEW "POWER JUMPER."

The constantly increasing difficulty of obtaining anything like reasonable rates renders it more than ever to introduce power-tools; for, even though the quality done be not quite so good, and consequently requires a finishing, the far greater quantity got through in a given more than compensates for the trifling additional income. But in some classes of work power-tools have given themselves even superior to those worked by hand, and rock-mining and quarrying purposes is fortunately among the yet the difficulty of combining adequate power with great and the necessary portability, has hitherto caused the rock-drills as ordinary mining implements to be far than it otherwise would have been. The working of a with respect to the quality of the work performed, all wished; yet, if its application necessitated the use of high steam, it will be obvious that there are many places in its advantages could not be utilised. It will be necessary to anyone who has been accustomed to the use of much easier it is to procure steam at 30 lbs. or 40 lbs. per inch, at (say)  $\frac{1}{2}$  mile from the boiler, than to obtain 80 lbs. at the same distance, the higher pressure necessitating pipes, more costly joints, and, indeed, more expensive altogether; so that it may be accepted as a principle that is of the greatest practical value which will perform work with steam at the lowest pressure.

For several years past Messrs. Charles Ball and Co., of street and Paris, known to the readers of the *Mining Journal* as manufacturers of machine tools and mining and colliery machinery, the part they have in the introduction of the rock-drill and of the power-jumper, has secured them, perhaps, the greatest promise in any invention, and in any invention, they are in a position to recommend to clients the best machine in the market, regardless of personal bias, and are now introducing, with the intention of testing the value of the Leigh drill, which poses they consider lent, a machine which

to be better suited to the wants of miners generally. The chine previously invented, and which has the great advantage of only about one-third the number of pieces, is considerably cheaper. The power-jumper, the general which will be seen from the above diagram, is the invention of Brydon, Davidson, and Warrington, and is certainly a useful machine as need be desired. It is much shorter, more readily removed

1873.]

## SUPPLEMENT TO THE MINING JOURNAL.

157

## Meetings of Mining Companies.

## CORNWALL MINERALS RAILWAY AND HARBOUR COMPANY.

Ordinary general meeting of shareholders was held at the street Hotel, on Monday,

Mr. CHARLES GILPIN, M.P., in the chair.

Calling the meeting was read by the secretary; and

the directors was taken as read.

MRMAN moved that the report and accounts be approved

, and said that his first business was to explain the he occupied the chair. The chairman of the company,

well aware, was their much esteemed and very able

A. C. Sheriff, M.P., the member for Worcester, but that had been unexpectedly summoned to Russia. In the

Mr. Sheriff it was the duty of the directors to appoint a number to act *pro tem.* as Chairman, and the lot had

him. He really had very little to say as to the pre-

of the company's affairs, but that little was entirely

He did not speak altogether from heresy when

the progress of the works was "entirely satisfac-

he himself (as had all the directors) been down to the spot,

and had himself at Fowey at the other, and the conviction of himself and

was the same—that the prospects held out in the prospectus

fully borne out by the facts as they developed themselves before

the directors were assured by the contractor that they would be ready

had engaged to hand them over, and the shareholders might

line opened for mineral traffic by the end of the present year,

or seven months before the time stipulated for in the contract. The

as the no doubt the shareholders were aware, had insisted upon the

passenger traffic, thus showing the opinion they had formed as to the

existing there. The company would not be ready quite so early

as the railway traffic for the mineral traffic; and speaking as he was to

understand railway business he need hardly point out that the most

which came in a mineral district was the mineral traffic. It was

a regular trade. It is loaded or unloaded by the aid of

it formed the most certain source of income which a rail-

way. In reference to the progress of the line he might say that

the early completion of the railway, the directors had ordered the

on a plan approved by the engineer, which would be ready

the railway was ready to be opened. Since the issuing of the

included the report of the engineer, there had been a subsequent

the engineer received only that morning by the board of directors, and

more about it than that it entirely confirmed the former report,

the works were progressing entirely satisfactorily. Now, he did

at all times deal in prognostications or prophecy; he could

everything which had occurred had convinced the directors that the

company as to the amount of traffic had been in no way over-

all that was held out in the prospectus would be fully realised,

being proceeded with heartily and earnestly, and in the full convic-

holders who had invested their money in the undertaking would

return, and those at an early period. In conclusion the Chair-

the adoption of the report and accounts, and said he should be happy

further information which any shareholder might wish for.—

Mr. LOUTH seconded the resolution, which was put to the meeting and

was seconded by Mr. C. H. ROBERTS, and carried.

Mr. LOUTH seconded the election of the Earl of Dunraven as a director.—

Mr. LOUTH seconded the resolution, which was carried.





had therupon agreed to take up a further number of shares; and he might mention that he had subscribed for 200, and he believed his colleagues had taken up proportionate amounts. Those shares had come into the concern at a later date than the rest, and they (the holders) had paid up to the extent only of that which was necessary for the purposes of the company; and they did not see the necessity of calling up capital until it was needed, but of course when it was required they would be ready to pay it. It was a course entered into by the directors in order to give greater stability to the company. (Hear, hear, and cheers.) —The resolution was then put to the meeting, and unanimously carried.

Capt. SWINHOR then moved, and Mr. POOLE seconded, that Mr. S. Slater be appointed as auditor to the company, and that his remuneration for the past year be £25.—The resolution was then put, and carried.

On the motion of Mr. A. CASSLES, a cordial vote of thanks was awarded to the Chairman and directors.

The CHAIRMAN, on behalf of himself and his colleagues, desired to thank the shareholders for this mark of confidence which they continued to repose in the board. He might assure the meeting that the affairs of the company called very much upon their time and attention, but which they were very willing to give, inasmuch as they felt confident as to the ultimate success of the concern; for from the last reports they could obtain there was every reason to believe an extraordinary development of wealth would shortly take place in this mine. (Hear, hear.) He might mention that no place afforded greater facilities for the satisfactory working of the mine than did the neighbourhood in which their property was situated. The proceedings were then brought to a close.

#### COLEFORD HEMATITE IRON ORE COMPANY.

The second ordinary general meeting of shareholders was held, on Monday, at the Cannon-street Terminus Hotel, Mr. H. D. GOOCH in the chair.

The SECRETARY having read the notice convening the meeting, The CHAIRMAN read the following report:

The directors have to report that since the first general meeting, held on July 24 last, satisfactory progress has been made with No. 1 shaft. The shaft has been sunk down to the ironstone measures, and the directors are glad to be able to report that the ore will soon be brought to bank. Owing to the very wet weather, and to the rock through which the shaft has been sunk proving exceptionally hard, progress has been delayed to a considerable extent. Under these circumstances the directors have deemed it fair to the contractors to extend the time fixed for the completion of the shaft, while reserving the company's rights to claim penalties in case of any relaxation in the contractor's efforts. Arrangements have been made for the supply of the necessary engines and winding gear, which will shortly be delivered, and every effort will be made to expedite the raising of ore for market, so that advantage may be taken of the present high prices, which there is every reason to believe will be maintained for some time. The current quotations are as follows, and the present demand unlimited:—For Forest of Dean ore, containing 45 percent. of metallic iron, 20s. per ton at Cardiff, and 6d. per ton extra for every unit of iron above this percentage. The directors have also to report that the railway between Monmouth and Coleford, and thence joining the Severn and Wye to Sydney via Park End, will be commenced early in the spring, and when finished will materially increase the facilities of transit. In accordance with the Articles of Association the directors retire from office, but being eligible offer themselves for re-election. The directors have appointed Messrs. C. F. Kemp, Ford, and Co., to be the first auditors of the company; but as according to the Articles it will be necessary for the company to elect auditors for the current year, the directors recommend that Messrs. Kemp, Ford, and Co. be re-elected.

The CHAIRMAN then remarked he had very little to add to the statements he had read. The miners were still sinking the shaft and proceeding with the work as fast as they could. They were now in the ironstone measures, and might any day strike upon the lode. The ore as soon as struck would be brought to bank and sent to market, in order that the full advantage of the high prices now ruling for good ore might be obtained. The recent strike in South Wales had very little decreased the demand for hematite ore, because a market for it could very easily be found in Staffordshire. The only question in the matter was the cost of carriage, but that he fancied would not materially diminish the chance of getting rid of any ore which may be obtained. In his opinion, the strike in South Wales cannot last long, and the men will be compelled to agree to the terms of the masters; but, in any case, the company will not be in a position to supply ore in any large quantity for some time to come, because of the time that must elapse before the work is sufficiently advanced for the men to get into the pits or churms. When the railway is completed between Coleford and Monmouth the company will be able to load into the railway trucks and deliver the ore at any of the furnaces in Monmouth or the smelting districts at a cost of about 2s. 6d. to 2s. 8d. per ton. He did not know that he had anything further to report, but he would be happy to answer any questions that might be put to him.

Mr. MURRAY: Should like to know when the payments will begin? —The CHAIRMAN: As soon as we make the profits.

Mr. MURRAY: When will that be? —The CHAIRMAN: It will take us about another month at least before we can raise ore.

Mr. MURRAY: How deep is the shaft? —The CHAIRMAN: 106 yards. The ore is within the depth that was estimated—120 yards.

In reply to further questions by Mr. MURRAY and Mr. Campbell,

The CHAIRMAN said that after the men got to the ironstone, in order to drive headings till they arrive at the ore, which is found in large churms. The ironstone measure was an indication of ore being in proximity to it. At a distance of about 300 yards from the company's shaft another company was now raising ore. The number of shares a lotte I was 675s. and 1200 more would be allotted, provided that 50,000 tons of ore are raised, in accordance with the agreement.

The CHAIRMAN then moved the adoption of the report, which was seconded by Mr. HOPKINS, and carried unanimously.

Mr. CAMPBELL proposed, and Mr. MURRAY seconded, the re-election of the directors, all of whom retired in accordance with the Articles of Association.

The motion was carried *unanimously*.

The retiring directors, Messrs. KEMP, Ford, and Co., were then re-appointed for the current year, a sum of 20 guineas being awarded to them for their past services.

A vote of thanks to the Chairman terminated the proceedings.

#### GLASGOW CARADON MINING COMPANY.

The 13th annual meeting of shareholders was held at Glasgow, when the chair was occupied by Mr. ARCHIBALD ARROL. The directors, in their report, congratulated the shareholders on the satisfactory state of the accounts, and stated that the balance at the credit of profit and loss is £726L 16s. 6d. As the shareholders are aware, there has not, since the commencement of the company, been anything written off preliminary expenses or plant account. This arose from there having been hitherto no profits from which it could have been done. As, however, there have been considerable profits made during the past year, and there is the prospect of this continuing, and as it is requisite that there should be a reserve fund, from which means might be immediately available in the event of any accident occurring to the mine, the directors are of opinion that these should receive consideration, and, though they have not written off an amount in the accounts, they are of opinion that a sum ought to be carried forward out of which this might be done. They therefore recommend that a dividend be declared of 15 per cent. on the fully paid-up shares, and a proportional amount on the new shares. This will amount to 5374. 3s. 3d., leaving 1322. 13s. 3d. to be carried forward. The revenue and expenditure account for the year ending Dec. 31 last showed that the amount for ore sold was 14,710. 3s., and the gain on working 520. 7s. 6d.

The CHAIRMAN, in moving the adoption of the report, congratulated the shareholders on the favourable position of the company's affairs, and remarked that, besides having a satisfactory balance this year, it was calculated that there were reserves of ore in the mine to the amount of from 50,000t. to 55,000t.

The report was unanimously adopted, and dividends were declared for the past year at the rate of 3s. per share on the paid-up shares, and 2s. 3d. on the other shares. The retiring directors were re-elected, and a sum of 500s. was voted to the directors for their past services.

#### BAMPFYLD COPPER MINING COMPANY.

The annual general meeting of shareholders was held, on Monday, at the Royal Hotel, Liverpool, —Mr. M. G. KLINGENDER in the chair.

There was a fair attendance of shareholders, amongst those present being Messrs. G. J. Blant, John Calder, R. Crook, J. P. Endean, W. E. Foster, J. Gidlow, Major Greig, C. B. Dr. Hakes, E. H. Hodgson, Wm. Klingender, J. P. Logan, J. Reis, R. Shaw, T. J. Spence, Rev. E. A. Telfer, J. H. Withers, and Dr. Worthington. —The SECRETARY having read the notice convening the meeting, the minutes of the previous meeting were confirmed. The report of the directors was taken as read.

The CHAIRMAN then moved that the report and accounts as presented be received and adopted. —Mr. ENDLEAN seconded the motion, which was unanimously agreed to. —On the proposal of Mr. J. P. ENDLEAN, seconded by Mr. CROOK, Mr. JONES REIS was elected to the vacancy in the board of directors. —On the proposal of Mr. ENDLEAN, seconded by Mr. BLANT, Mr. W. KLINGENDER was re-elected a director of the company. —On the motion of Mr. J. GIDLOW, seconded by Mr. BLANT, Mr. A. L. FORD was re-elected an auditor of the company. —On the proposal of Mr. BLANT, it was resolved that the next general meeting of shareholders should be held within six months from the present date.

The report of the managing agent of the mines having been read was considered highly satisfactory, and several questions being put to him relative to the mines were answered *in extenso* very gratifyingly to the shareholders, especially when he told them that very shortly he would be enabled to return three times the quantity of copper they are now doing per month, and the iron lodes were opening splendidly.

A vote of thanks having been passed to the directors and manager, the proceedings terminated, the shareholders calculating upon a good dividend at the next general meeting, to be held about six months hence.

#### HOBBS HILL MINING COMPANY.

The second ordinary general meeting took place at the offices of the company, on Monday, Mr. A. F. PAULL in the chair.

The following report was read:—

Feb. 1: Since my last report to the directors it has been considered necessary to sink the shaft nearer the adit than was at first thought of, which is now in course of sinking about 70 fms. west of the river, and 60 fms. from the mouth of the adit. The shaft sunk 7 fms. from surface. At this depth the lode is cut through; it is a strong ledge, about 2 ft. wide, containing a little tin. The ground is hard, and the water quick, in consequence of which we have not been able to develop it as quickly as we should otherwise have done. The lode has been driven on west 25 fms., several fathoms of which is very good paying ground. The last 8 fms. having been much harder ground the lode has not been quite so large, or so productive for tin; the lode and ground are improving a little. If the ground makes fair I have no doubt but that the lode will improve with the change. The lode at present produces about 16 lbs. of tin per ton of stuff. We have about 25 fms. to drive to reach the shaft, and 8 or 9 fms. to sink the shaft to meet the level to which point we will tend with the utmost speed. I do not recommend your purchasing

the materials until we have opened and proved more of our western ground, which, if found to be as productive as that to the east, will make it a very profitable mine. I wish you every success in its development.—JAMES PEARCE.

The CHAIRMAN said: Gentlemen, from the accounts in your hands you will observe that tin to the value of £400. 8s. 5d. has been produced from working the elvan course, but at very considerable cost. This has induced the directors to discontinue operations on the elvan course until they could erect machinery on their own sett. After considerable delay, your directors have only recently obtained the use of an old lead, which will now permit of machinery being erected of the most efficient description. The accounts show available assets of £1655. 17s. 3d. to meet the cost of the erection of the proposed machinery, and also the further prosecution of the works on the mine. He (the Chairman) moved the adoption of the report and balance-sheet, which was seconded, and carried unanimously.

Capt. JOHN E. LYONS was re-elected a director, and Messrs. G. M. Bright and Co., public accountants, as auditors.

A vote of thanks to the Chairman concluded the meeting.

[For remainder of Meetings see to-day's Journal.]

#### BAMPFYLD COPPER AND IRON MINES, DEVONSHIRE; BOS-CASWELL DOWNS TIN AND COPPER, AND BRYNN TIN MINES, CORNWALL.

Several gentlemen from London largely interested in mines, have just returned from a tour of inspection of the mines in Devon and Cornwall, and for the interests of the investing public have made a speciality of the three above mines, which they deem most valuable properties. The *Bampfylde* is situated near North Molton, in Devonshire. The property is most extensive, being about two miles square, having several valuable copper and iron lodes traversing the entire sett. The mine is beautifully situated in having natural advantages, not only for the drivages in the surrounding hills, giving immense backs on their lodes for easy and economical working, but is amply supplied with water-power for all the working machinery, which is very extensive and powerful, one of the wheels being 50 ft. in diameter, and 4 ft. 8 in. broad, equal to a 70-inch cylinder engine, capable of sinking the mine to an immense depth. It is already sunk 112 fms. deep. At the 40 fathom level the previous company raised and sold over 80,000s. worth of copper ore (the copper is of the richest description, being silver grey and yellow ore). Levels are being driven underneath this rich course of ore at 50 fms., 70 fms., 80 fms., 90 fms., 100 fms., and at 112 fms., all of which have recently got into the shoot of ore gone down from the 40, and from these drivages they are openly up large reserves, which may be stopped away at a trifling cost. Sales of copper ore have been regularly taking place. They have just shipped for this month's sale 50 tons of this rich ore; a large bulk of it is estimated to realise 16s. per ton, whilst the average produce in Devon and Cornwall would be about 5s. per ton, and they have already at the surface about 25 tons more towards the next sampling. The manager states that in about a month's time, judging from the improved state of the mine, that he will be enabled to return about three times the usual quantity. (We would here remark that in the manager of the *Bampfylde* the company have a thorough energetic and practical mining engineer, in a word, "the right man in the right place.") Beside these workings they have just cut into another side lode, which is producing rich copper ore, and promises to be of equal importance to the one already being worked on. A new copper lode has also been discovered at the surface, yielding rich copper ore. They are now driving on the course of this lode from the side of the hill, and which will give them from 30 to 40 fms. of backs, and a course of ore to be taken away high and dry at a trifling expense. In addition to the copper mine, seven very important iron lodes have been discovered, yielding iron of high percentage, assayed at 60 per cent., varying from 8 tons to 20 tons of iron ore per fathom, and is practically inexhaustible. Shortly the Devon and Somerset Railway will be opened, when thousands of tons of this iron can be sent over it monthly to the market, leaving immense profits to the shareholders, and we firmly believed that on or about Midsummer next the directors will be in a position to pay a dividend on the shares of at least 30 per cent. per annum. Some belief it will be considerably beyond that amount.

*Boscaswell Downs*.—This extraordinary old mine is situated in the parish of St. Just, near Penzance, Cornwall, a district renowned for its large yield of tin, and is surrounded by the rich metallic mines of the neighbourhood—the Botallack, Balleswidden, Wheal Owles, Speare Moor, Ding Dong, St. Just, Anandal, and the Levant Mines. On reference to some old memoranda, it shows that profits had been made, and dividends paid up to 1863 of 4s. 000. Shortly after this the mine changed hands, and had been worked very successfully by a private company, who had since sold it to the present proprietors, to whom much credit is due for their energetic *modus operandi* in carrying out extensive operations both on the surface and underground. There are 28 heads of stamps continually at work stamping out the tinstuff with very satisfactory results. A great improvement has been made in the dressing department, and large parcels of tin are being made marketable, which realises the highest market price. Their usual sales are from 10 to 15 tons of black tin per month. A new and very interesting feature to the mining community of Cornwall is the Rosey winding engine recently erected, which has completely thrown the old Cornish engines entirely in the shade, inasmuch as it will draw up to surface the skip containing a ton of stuff, in addition to its own weight, from the 140 ft. level, in the space of a minute and a quarter, and the consumption of coal is about one-tenth part of that consumed by the ordinary engines; this is creating great excitement in the county. The second Rosey engine is now in course of erection on the mine, to replace another Cornish engine. This company has recently added another valuable mineral property to their original set, which is also producing good tin ground, and from which much deeper day levels on the course of the lode can be obtained, giving very high backs in all the lodes. In order to carry on the operations of the company with greater facility and economy, a new rail is being laid down direct from the mine to the dressing-rooms, and in cutting through the ground a very important copper lode has been discovered, which enhances the value of this property immensely.

*Brynn Tin*.—This popular investment is situated in the parish of St. Mewan, near St. Austell, Cornwall, and is the most productive tin district in the county. Their operations have been carried on in a tin-producing elvan course, which is about 20 fathoms wide, runs through the entire sett, and is inexhaustible. The yield of tin from it exceeds their anticipations; they have 36 heads of stamps at work, stamping out about 36 tons of tin elvan per day, and everything going on is "Merry as a marriage bell," when within the last fortnight they were overtaken by an excess of rain, which retarded their progress, at the same time bringing down a tremendous piece of ground on the side of the opening on the elvan course, which traverses the entire property. It has since been cut into three places, and the lode is 5 ft. wide, 4 ft. of which carry tin, and will go direct to the stamping-mills, giving an average yield of 35 lbs. to the ton of stuff. The new shaft going down will intersect this valuable lode at 20 fathoms deep, where it is expected that the will be found of a much richer quality. This mine is attracting great attention in the district, and shares are being eagerly sought after. Their attention was also called to the—

*Woodclose and Polgoon*, which is situated in the parish of St. Mewan, near St. Austell, Cornwall, and in the strike of the Polgoon, Great Hewa, and other mineral mines in the St. Austell district. The principal workings are being carried out on the Polgoon and Woodclose lodes, and, so far as operations have been extended, with satisfactory results, producing a fair quality of tin, and the lodes have all the characteristics that a miner could desire for the production of large bodies of tin as development goes on.

*West Caradon*.—A mine now looking up well for the future, and about which speculation is rife at this time. This mine is situated in the parish of St. Cleers one of the finest localities in Cornwall, and will take a very prominent place amongst the fortunate speculations of this year. Unfortunately, the heavy rains lately experienced have greatly retarded the extensive operations contemplated on the eastern boundary. It is said that close on 50,000t. has been expended on this enterprise, which is selling at just half that figure at the present time. Telegrams are almost daily awaited from the mine of a very highly favourable character, which it is believed will change the will of the adventure altogether, and place it on the market as one of the most attractive and substantial investments. In calculating the present value, and the future prospects of West Caradon, a fact appears to be overlooked of some consideration—the enormous deposits of copper ore which were extracted from it some few years since. It is anticipated that similar results will shortly be again realised. When the shares of this undertaking stand at 3s. per share, the investing public will really believe in the solidity of this great mine, and that the quotation named approximates more nearly to its real worth, the quotation of 5s. being too low for "Honest Creditability." It is, however, understood that the best judges are likely to up these securities. Over 50,000t. can still be used as working capital, if we calculate the amount also in hand, but of this sum it is not expected that more than half will be required. A very important fact in corroboration of the remarks on this mine generally may be mentioned—that the ores are 14s. 4d. per ton higher in the market than Devon Great Consols; in other words, 3s. 19s. 10d. per ton, Devon Great Consols realising only 3s. 6s. 6d.—an enormous difference in 1900 tons of ore.

*South Tolcarne*.—The report in last week's Journal stated that the great South Tolcarne lode is only 2 fms. from the deep adit cross-cut on the gossan lode south—that is, the great champion lode of Cornwall. The shares of this mine are 6000t. in number, and may be purchased for the sum of 15s. per share, making the value of the mine to be 45000t. Not many months since these securities could be largely dealt in at 30s. per share—a fall of 10 per cent. It has the prospects of few mines in Cornwall at this time are considered more certain of a sudden success. It is not generally known that Mr. Jos. Vivian is the largest shareholder in South Tolcarne Mine, and that he was also the true prophet of her rich neighbour, South Condurrow, being bounded on the east by the latter enterprise and immediately adjoining it. On the south it is bounded by Wheal Grenville, also adjoining it. Compare the present capital of South Tolcarne with these two mines, and we find—South Condurrow, with her 6123 shares, standing at 8s. 5d., representing 54,000t. for the concern! Wheal Grenville, with her 5179 shares, standing on the market at 6s. per share, valued at 31,074t. It is confidently asserted that South Tolcarne is about to become a second South Condurrow, the lode of the latter traversing the entire sett; the lode in the north part of the sett also, previously worked by another company, and yielding very rich copper ores in large quantities, all dip towards South Tolcarne, and more especially the great South Condurrow tin lode. There is a splendid 60-in. engine erected on the mine, which affords ample power for developing the whole of the lodes (five in number). This mine is also taking advantage of the work already accomplished, and it may be mentioned that the South Condurrow Mine has already explored the ground, and determined the position of the great champion lode. A glance at the plan of the mining district of the parishes of Heligan, Camborne, and Redruth will at once give us the situation of this mine, the richest locality of Cornwall. In ten days time this mine will cut the great champion tin lode, or even in less time. It is believed by the most astute that it will cut rich. It must also not be overlooked that in the deep adit level, west of cross-cut, the rising in the back is already worth fully 3 tons of copper ore per fathom. A credit balance remains in hand of over 4000t. at the last meeting, which was held at the commencement of this year.

*St. Ives Consols*.—An unexpected but quiet demand has sprung up for St. Ives Consols mine shares, which are difficult to be bought at any price. An enquiry shows that in addition to the late valuable lode in the western part of the mine, there have been important discoveries on Daniel's lode and on the cau-

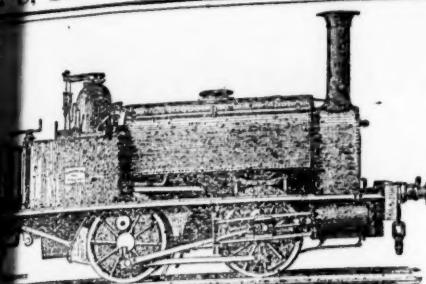
ter; and further, that the return for the present quarter will be less than some years past. The shares, lately down to 11s., are now scarce at 12s. advancing strongly to 30s. after the account on the 18th inst.—CORNWALL.

*Tin*.—Messrs. Van Houten and Ebeling (Rotterdam), considerables improvement has taken place in tin in this month, the consumption ruling on an extensive scale, while several purchases on open contracts have been stimulated by the decreasing rates and prices show an advance of 2 fl. to 3 fl. Banca with a limited tonnage has been in good request from 85½ fl. to 87½ fl., while 84 fl. to 85 fl. has been in good request from April and May delivery. Biliton has been in general use in an extensive business for export. From 81½ fl. the price goes to 85½ fl. Several floating parcels changed hands at 82 fl. to 84 fl. Feb. 3, a public sale comprising 8000s. peculio Biliton will take place on the position of Banca tin in Holland on Jan. 31, according to the Official Dutch Trading Company, was—

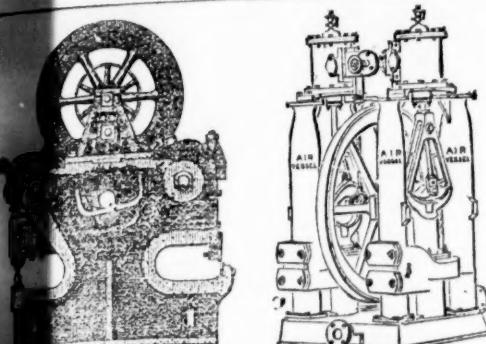
1873.	1872.
Slabs 16,960	12,996
Deliveries in January	.....
Stock second-hand	28,251
Total stock	111,724
Afloat	.....
Statement of Biliton:—	.....
Import in January	Slabs 3,580
Delivered in January	.....
Stock	7,658
Afloat	.....
Quotation of Banca	85 fl.
Jan. 31, 1 Biliton	85

These combined returns of Banca and Biliton for 1873, compared with 1872, exhibit—an increase of the import for January of 169 tons, an increase of the stock available for

FEB. 8, 1873.]



TANK LOCOMOTIVES,  
FOR SALE OR HIRE.  
HENRY HUGHES AND CO.,  
LOUGHBOROUGH.



## JOHN CAMERON,

MAKER OF  
STEAM PUMPS, PORTABLE ENGINES, PLATE BENDING ROLLERS,  
BAR AND ANGLE IRON SHEARS, PUNCHING AND SHEARING  
MACHINES, PATENTEE OF THE DOUBLE CAM LEVER  
PUNCHING MACHINE, BAR SHEARS, AND RAIL  
PUNCHING MACHINES.

EGERTON STREET IRON WORKS,  
HULME, MANCHESTER.

## ORE-DRESSING MACHINERY.

ON TROMMELS, JIGGING MACHINES.—Continuous and auto-  
CLASSIFIERS, SHAKING TABLES, BUDDLES, PERFORATED  
Trommels, Jigging Sieves, and Stamps' Grates. SACH'S ROCK-  
used at Altenberg, Commern, Saarbruck, and Mosen.

Particulars, apply to—

MESSRS. KEMBER AND CO.

CLIFFORD GROVE, DRUMMOND STREET, N.W., LONDON.

BENNETT'S SAFETY FUSE WORKS,  
ROSKEAR, CAMBORNE, CORNWALL.BLASTING FUSE FOR MINING AND ENGINEERING  
PURPOSES,

Wet or dry ground, and effective in Tropical or Polar Climates.

BENNETT'S, having had many years' experience as chief engineer with  
the Royal Engineers, is now enabled to offer Fuse of every variety of  
manufacture, of best quality, and at moderate prices.

MOTORS OFFICE—H. HUGHES, Esq., 85, GRACECHURCH STREET.

ICKFORD, VENNING, AND CO.,  
MANUFACTURERS OF THE  
IMPROVED SAFETY WATERPROOF BLASTING  
CARTRIDGES.

Specially adapted to the requirements of the Mines Regulation Act.

These cartridges are extensively used in Coal and Metalliciferous Mines, Railway  
Tunnels, Quarries, and for Submarine Blasting, both at home and abroad. They  
possess explosive power with a saving of time, and almost absolute immunity  
from danger to the operative incident to the use of loose powder.

For further information, may be obtained at the offices,—

BUCKING MILL, CAMBORNE, CORNWALL; or at  
ADRIEL BANK CHAMBERS, SOUTH JOHN STREET, LIVERPOOL.

## PEAT FUEL.

MESSRS. HY. CLAYTON, SON, AND HOWLETT, of the  
PEAT WORKS, HARROW ROAD, LONDON, PATENTEES AND  
CREERS OF THE MACHINERY AND PLANT for the CONVERSION  
CONDENSED BLOCKS for FUEL, invite attention to their re-  
LATED MACHINERY, and also refer all who are interested in theMR. WILLIAM ELSAM,  
SOLE AGENT,  
VARINO TERRACE, DALSTON RISE,  
LONDON.FURNISHED to FURNISH ALL INFORMATION, PLANS, and ESTIMATES  
for the CONSTRUCTION of PEAT WORKS (or, if required, to superintend same), com-  
plete in the system embodied in the above patents.

THE MINES REGULATION ACT, 1872.

CHARLES WINN AND CO.,  
WOOD STREET, BIRMINGHAM,  
MANUFACTURERS OF  
PRICKERS, STEMMERS, AND THE NEW  
SCAPER AND CHARGER COMBINED.

Of the most approved metal, and various sizes.

PRICES ON APPLICATION.

SMITH AND LANGLEY'S  
SENTINEL SAFETY VALVE.

A new and highly successful discovery; it is an exact pressure indicator, and gives reliable alarm and relief the instant the proper pressure is exceeded. It is a perfect check on all other safety valves and gauges—can be adapted to any variety of pressure—can be fixed on any boiler in two hours without breaking man-hole joints.

Each "Sentinel" is guaranteed accurate. Prospects containing full details and terms forwarded on application to the office, 10, Red Lion-court, Fleet-street, E.C., to Robert Jones, agent.

Agents wanted throughout the kingdom.

THE GREAT ADVERTISING MEDIUM FOR WALES.  
SOUTH WALES EVENING TELEGRAM  
(DAILY), and  
SOUTH WALES GAZETTE  
(WEEKLY), established 1857.The largest and most widely circulated papers in Monmouthshire and South Wales.  
HEAD OFFICES—NEWPORT, MON.; and at CARDIFF.

"Evening Telegram" is published daily, the first edition at Three p.m., the second at Five p.m. On Friday, the "Telegram" is combined with the "South Wales Gazette," and advertisements ordered for not less than six columns will be inserted at an uniform charge in both papers.

Cheques payable to Henry Russell Evans, 14, Commercial-street, Newport, Monmouthshire.

PRIZE MEDALS—PARIS, 1867; HAVRE, 1868; HIGHLAND SOCIETY, 1870.

## B. &amp; S. MASSEY, OPENSHAW CANAL IRONWORKS, MANCHESTER.



PATENTEES AND MAKERS OF DOUBLE AND SINGLE-ACTING STEAM HAMMERS of all sizes, from 17 lbs. to 20 tons, with Self-acting or Hand Motions, in either case giving a perfectly DEAD-BLOW, while the former may be worked by hand when desired. Large Hammers, with Improved Framing, in Cast or Wrought Iron. Small Hammers working up to 500 blows per minute, in some cases being worked by the foot of the smith, and not requiring any separate driver.

SPECIAL STEAM STAMPS, of great importance for Smith Work, Bolt-making, Punching, Bending, &c.

Hammers for Engineers, Machinists, Shipbuilders, Steel Tillers, Millwrights, Coppersmiths, Railway Carriage and Wagon Builders, Colliery Proprietors, Ship Smiths, Bolt Makers, Cutters, File Makers, Spindle and Flyer Makers, Spade Makers, Locomotive and other Wheel Makers, &c.; also for use in Repairing Smelting Mills and Works of all kinds, for Straightening Bars, Bending Cranks, Breaking Pig-Iron, &c.

STEAM HAMMERS AND STEAM STAMPS MAY ALWAYS BE SEEN AT WORK.

## ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

CARDIFF MEETING, 1872.

## CLAYTON AND SHUTTLEWORTH

Have much pleasure in announcing the following List of Prizes awarded them at this Show:

"For the Best Portable Steam Engine" .....	THE FIRST PRIZE OF £40.
"For the Best Combined Portable Thrashing Machine" .....	THE FIRST PRIZE OF £40.
"For the Best Combined Portable Trashing and Finishing Machine" .....	HIGH COMMENDATION.
"For the Best Straw and Hay Elevator (Stacking Machine)" .....	THE FIRST PRIZE OF £10.
"For the Best Straw Elevator" .....	SILVER MEDAL.

CLAYTON AND SHUTTLEWORTH have received FIRST PRIZES AT EVERY TRIAL OF THE ROYAL AGRICULTURAL SOCIETY at which they have competed since 1849; and on three occasions in succession—namely, at Bury St. Edmunds in 1867, at Oxford in 1870, and at Cardiff, as above, they have been awarded all the First Prizes offered for Steam Engines.

MOSCOW GREAT EXHIBITION, 1872, TWO GOLD MEDALS, viz.:—

PORTABLE STEAM ENGINE.—"For Simplicity of Construction."—GRAND GOLD MEDAL.

FOR COMBINED THRASHING MACHINES.—GRAND GOLD MEDAL.

Revised Catalogues free, by post, on application to—

CLAYTON AND SHUTTLEWORTH, LINCOLN,  
78, LOMBARD STREET, LONDON, AND 35 AND 37, TARLETON STREET, LIVERPOOL.

## BOLTS AND NUTS. BOLTS AND NUTS.

MADE BY PATENT MACHINERY.

Suitable for Engineers, Millwrights, Coach and Wagon Builders, Colliery, and other Purposes.

AN EXTENSIVE ASSORTMENT OF OVER 200 TONS ALWAYS IN STOCK.

From which orders can be promptly executed. Every description of Bolts and Nuts made to order.

## BAR IRON. BAR IRON.

OVER 1000 TONS OF BARS, PLATES, SHEETS, ANGLES, HOOPS, SQUARES, ROUNDS, AND FLATS.

All of First-class Quality.

## RAILWAY, COLLIERY, AND TRAM RAILS, TO ANY SECTION.

A large Stock of Anvils, Vices, Tue Irons, Smiths' Bellows, Files, Raspers, Picks, Spades and Shovels, Sledge and Hand Hammers, Best Swedish Horse Nails, Back Bands, Plough Traces, Best Spring, Cast, Double Shear, and Blister Steel.

JOHN STANSFIELD (late Stansfeld and Sons), Iron Merchants, Bolt and Nut Manufacturers,  
ALFRED STREET, BOAR LANE, LEEDS.

BY HER MAJESTY'S



ROYAL LETTERS PATENT.

STANLEY'S PATENT FURNACE,  
FOR SMELTING ORE OR RE-MELTING IRON OR OTHER METAL,

PUDDLING AND ALL KINDS OF HEATING FURNACES.

JOHN MARTIN STANLEY, PATENTEE & SOLE LICENSOR,  
SHEFFIELD.

The advantages of these furnaces are, in the first place, they effect a saving of from 25 to 50 per cent. in fuel. 2ndly, The use and expense of grate-bars are dispensed with, as these furnaces have closed fire-places, formed in brickwork. 3rdly, They make from 80 to 90 per cent. less ashes than open fire-grate furnaces. 4thly, They have a purer flame, the combustion is more complete, and contains less free or unmixed air or gases. 5thly, The workmen have much less labour in working these furnaces. 6thly, They heat quicker, and are more under the control of the furnace-men. 7thly, They are not affected by the position of the wind or draughts. 8thly, The mills and workshops are cooler and more comfortable than where the open fire-grate furnaces are used.

For prices, and other information, apply to J. M. STANLEY, 27, Change-alley, Sheffield.

THOMAS WARDEN,  
LIONEL STREET, BIRMINGHAM,  
IRON AND STEEL MERCHANT,Manufacturer of Every Description of Railway, Colliery, and Contractors' Plant.  
A LARGE STOCK OF SECOND HAND RAILS AND PLANT ALWAYS ON HAND.CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,  
AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which will corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

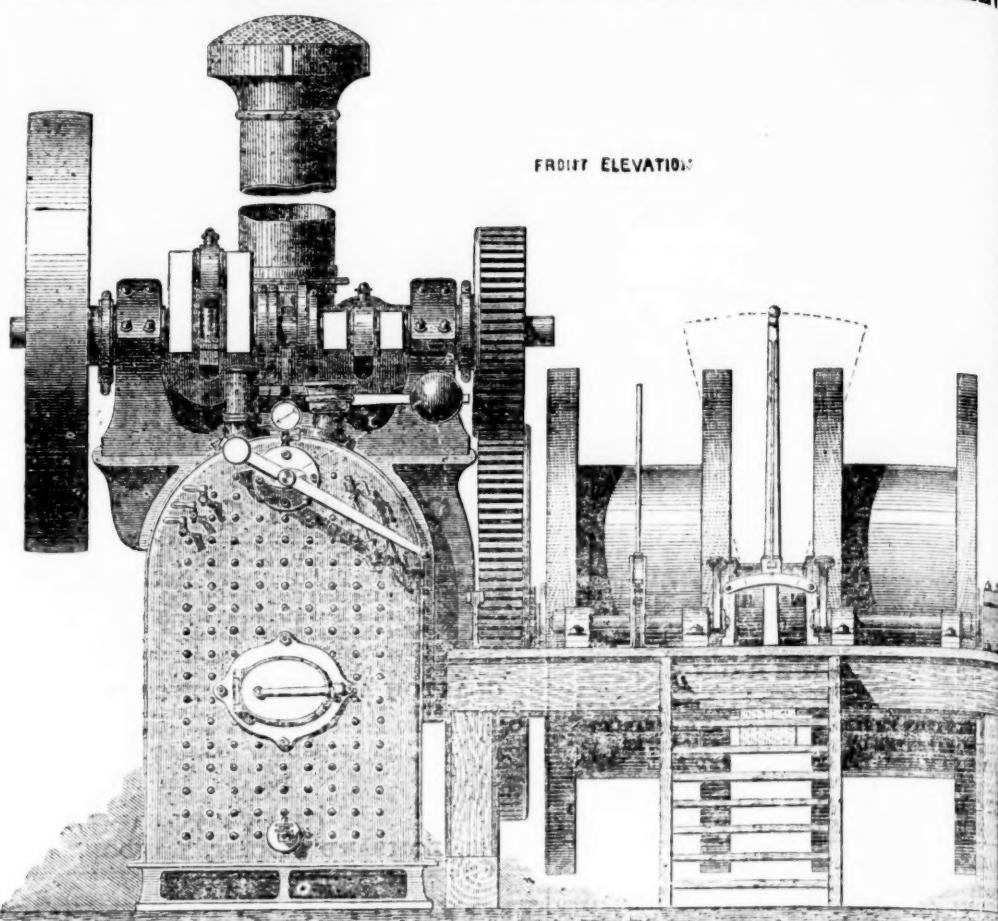
The lubricating power of this oil is equal to Sperm or Lard Oil.

T. W. KEATES, F.C.S., &amp;c. &amp;c.

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

LONDON : CASTLE BAYNARD, UPPER THAMES STREET.

WORKS : MILLWALL, POPLAR ; and ERITH, KENT.

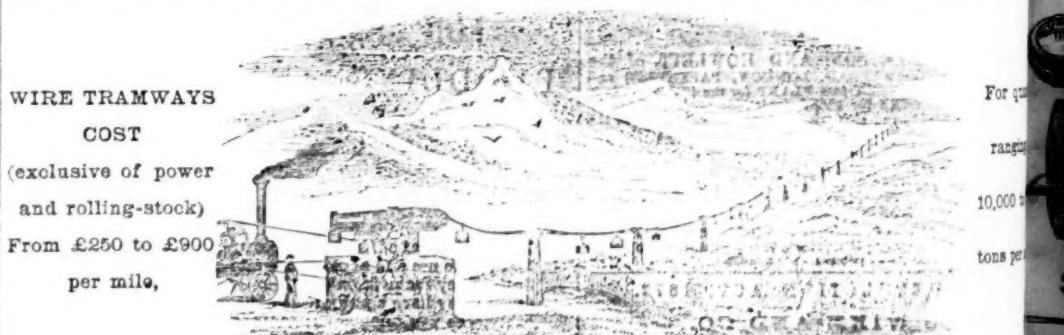
**McNIEL, MULLER, AND CO.,**39, MARKET STREET,  
MANCHESTER,SOLE AGENTS FOR  
"S. B. HEMMATITE,"  
"S. B. YORKSHIRE,"  
"CLAY LANE,"  
"CLAY CROSS,"AGENTS FOR JACKSON, GILL, AND CO., IMPERIAL  
IRONWORKS, NEAR MIDDLESBOROUGH;  
DARLINGTON WAGON COMPANY, DARLINGTON.SCOTCH, HEMMATITE, STAFFORDSHIRE, DERBYSHIRE, FOREST OF  
DEAN, COLD BLAST AND REFINED PIG IRON, PUDDLED BARS AND  
BAR IRON, STEEL, SPLETER, TIN, COPPER, LEAD, SHEETS, ORES,  
BOLTS, NUTS, SPIKES, MANUFACTURED IRON, &c., &c.**JOHN BOURNE AND CO.**ENGINEERS, SHIPBUILDERS, AND CONTRACTORS,  
BLOWING ENGINES, WINDING ENGINES,  
Bourne's Patent Spherical Governors, Bourne's Patent Feedwater Heaters,  
Bourne's Patent Gas Furnaces, Bourne's Patent Coal-dust Furnaces,  
PUMPING ENGINES, STEAM BOILERS,  
66, MARK LANE, LONDON.**SOMERVELL BROTHERS,  
NETHERFIELD, KENDAL,**MANUFACTURERS OF  
LEATHER BANDS, HOSE PIPES, FIRE BUCKETS,  
HAND LEATHERS, BLUE BENDS, AND  
THE KENDAL ENGINE BENDS,  
And every description of LEATHER for ENGINEERING and  
COLLIERY PURPOSES.**BICKFORD'S PATENT SAFETY FUSE,**  
FOR CONVEYING FIRE TO THE  
CHARGE IN BLASTING ROCKS, &c.  
Obtained the PRIZE MEDALS at the "ROYAL EXHIBITION" of 1851; at the "INTERNATIONAL EXHIBITION" of 1852, in London; at the "IMPERIAL EXPOSITION," held in Paris, in 1855; at the "INTERNATIONAL EXHIBITION," in Dublin, 1865; at the "UNIVERSAL EXPOSITION," in Paris, 1867; and at the "GREAT INDUSTRIAL EXHIBITION," at Altona, in 1869.**BICKFORD, SMITH, AND CO.**  
OF TUCKINGMILL, CORNWALL, MANUFACTURERS AND ORIGINAL PATENTEE'S OF  
SAFETY FUSE, having been informed that the name of their firm has been attached to fuse not of their manufacture, beg to call the attention of the trade and public to the following announcement:—  
EVERY COIL of FUSE MANUFACTURED by them has TWO SEPARATE THREADS PASSING THROUGH the COLUMN of GUNPOWDER, and BICKFORD, SMITH, AND CO. CLAIM TWO SUCH SEPARATE THREADS AS THEIR TRADE MARK.For Excellence  
and Practical Success  
of Engines  
 Represented by  
Model exhibited by  
this Firm.**HARVEY AND CO.,**  
ENGINEERS AND GENERAL MERCHANTS,  
HAYLE, CORNWALL,  
HAYLE FOUNDRY WHARF, NINE ELMS, LONDON,  
AND 115, GRESHAM HOUSE, E.C.  
MANUFACTURERS OFPUMPING and other LAND ENGINES and MARINE STEAM ENGINES  
the largest kind in use, SUGAR MACHINERY, MILLWORK, MINING  
MACHINERY, and MACHINERY IN GENERAL  
SHIPBUILDERS IN WOOD AND IRON.SECONDHAND MINING MACHINERY FOR SALE,  
In FIRST-RATE CONDITION, at MODERATE PRICES.PUMPING ENGINES; WINDING ENGINES; STAMPING ENGINES;  
STEAM CAPSTANS; and CRUSHERS of various sizes. BOILERS, PIT  
WORK of all descriptions, and all kinds of MATERIALS required for  
MINING PURPOSES.THE PATENT PNEUMATIC STAMPS  
May be SEEN AT WORK at HAYLE FOUNDRY WHARF, NINE ELMS,  
by previous application at either of the above addresses.**CAPTAIN TREGAY'S  
IMPROVED  
STAMP COFFER,**  
FOR STAMPING GOLD QUARTZ, TIN, AND OTHER ORES.The grate-way is extended, discharge loudly increased, and power economised.  
May be inspected in full work, on application to Captain TREGAY, Redruth,  
Cornwall, who is PREPARED to TREAT for GRANTING LICENSES for its use,  
or to SUPPLY the MACHINES.**JOHN AND EDWIN WRIGHT,**  
PATENTERS.  
(ESTABLISHED 1770.)  
MANUFACTURERS OF EVERY DESCRIPTION OF  
IMPROVEDPATENT FLAT AND ROUND WIRE ROPES  
from the very best quality of charcoal iron and steel wire.  
PATENT FLAT AND ROUND HEMP ROPES,  
SHIPS' RIGGING, SIGNAL AND FENCING STRAND, LIGHTNING CONDUCTORS, STEAM PLOUGH ROPES (made from Webster and Horsefall's  
patent steel wire), HEMP, FLAX, ENGINE YARN, COTTON WASTE,  
TARPAILING, OIL SHEETS, BRATTICE CLOTHS, &c.UNIVERSE WORKS, MILLWALL, POPLAR, LONDON.  
UNIVERSE WORKS, GARRISON STREET, BIRMINGHAM.  
CITY OFFICE, No. 5, LEADENHALL STREET, LONDON, E.C.**GIRDWOOD'S  
PATENT RECIPROCATING CRUSHER**  
is the SIMPLEST and BEST PULVERISER in existence. It will do BETTER  
WORK, and MORE OF IT, on same power than any other yet invented.  
Apply for terms to GEORGE GREEN, Aberystwith; or to the patentee,  
ROBERT GIRDWOOD, Edinburgh.  
MAY BE SEEN AT WORK AT GREAT DARREN MINE, NEAR  
ABERYSTWITH.**J. AND F. POOL,**  
WIRE WEAVERS,  
MINE SIEVE AND STAMPS' GRATE MANUFACTURERS,  
COPPER BOTTOM PERFORATORS,  
WORKS AT  
COPPERHOUSE, HAYLE, CORNWALL.THE DON LUBRICATING OIL  
IS 40 PER CENT. CHEAPER THAN ORDINARY KINDS,  
AND QUITE AS GOOD AND DURABLE.  
It is absolutely free from the very common defect of gumming.  
Mr. HEWLETT, of the Wigton Coal and Iron Company, says:—"I have used it for  
two years, and find it answer exceedingly well for lubricating purposes."  
Trials may be made at our risk.AGENTS WANTED AT HOME AND ABROAD.  
**DUNCAN BROTHERS,**  
2, BLOMFIELD STREET, LONDON, E.C.**THE ROBEY MINING ENGINE**

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

**ROBEY AND COMPANY, LIMITED  
PERSEVERANCE IRONWORKS, LINCOLN.**  
ALSO OF PATENT PORTABLE**HAULING AND WINDING ENGINE  
WITH  
PATENT DRUM WINDLASSES,  
FOR MINING PURPOSES.**This Engine is specially commended to Mining Engineers and others, as by its adoption—  
Haulage along inclined drifts is easily and cheaply effected;  
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required;  
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;  
It can be very quickly removed (being self-propelling), and fixed in any desired position.  
Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL



And are at present successfully employed in lengths from a quarter of a mile to fourteen miles in transport of coal, iron, clay, coke, general mining produce, beetroot, sugar-cane, &amp;c. They are working in most difficult and mountainous districts where any other means of transport is impossible, as well as through ordinary country.

ABOUT SEVENTY LINES HAVE ALREADY BEEN CONSTRUCTED.

**THE WIRE TRAMWAY COMPANY (LIMITED)**

Are PREPARED to SURVEY and ESTIMATE for LINES and EXECUTE CONTRACTS at HOME and ABROAD, by engineers employed in constructing these lines in England, Holland, Prussia, Austria, Russia, Italy, Spain, United States, River Plate, India, Bolivia, West Indies, and Egypt. The system has been adopted by the English and Anglo-Indian Governments, and for many of the first mines and ironworks at home and abroad.

**WIRE TRAMWAY COMPANY (Limited), 21, Gresham-street,****FRANCIS MORTON & CO., LIMITED, LIVERPOOL**  
Manufacture, in Galvanised and Corrugated Iron,  
**IRON ROOFS, IRON BUILDINGS, IRON SHE**

Which they have extensively supplied and erected for mining requirements at home and abroad.

ESTIMATES FURNISHED ON RECEIPT OF PARTICULARS.  
**F. M. & CO.'S PATENT IRON ROOFING TILES OR SLATES**  
SPECIAL FAVOUR FOR TEMPORARY COVERING,

They require considerably less framework to carry them than ordinary slates or tiles.

ILLUSTRATED CATALOGUE ON APPLICATION.

**London Office, 36, PARLIAMENT STREET, S.W.**

1873.]

# THE "BURLEIGH" ROCK-DRILLING MACHINERY.

## THE "BURLEIGH" ROCK DRILL.

### PRIZE MEDALS:

Royal Cornwall Polytechnic Society,  
August 21, 1872.

Liverpool and Manchester Agricultural  
Show, Sept. 12, 1872.

Middleton Agricultural Show,  
Sept. 18, 1872.

THOMAS BROWN,  
PATENTEE  
AND  
SOLE PROPRIETOR.

SPECIALLY APPLICABLE  
FOR  
MINING, QUARRYING,  
AND  
MINING PURPOSES.

This celebrated ROCK DRILL, which by reason of its inherent  
virtues has superseded all other Rock Drills, is now in extensive  
use in America, England, Scotland, and the Continent, and is in-  
valuable in the economic working of all Mines, Quarries,  
Canals, Roads, &c.

After many trials of other machinery, it was found to be the  
only machine by which the greatest engineering work of the age  
the Hoosac Tunnel in America—could be accomplished.

Its advantages are as follows:—  
First,—It does not get out of order.

Second,—It drills through Aberdeen granite at the incredible  
rate of 10 inches per minute.

Third,—Independent of the enormous saving effected in the  
cost of labour, such as pumping, ventilation, interest of capital,  
from the fact of the "put out" being increased fourfold, the  
economy, as compared with hand labour in actual drilling, is very  
considerable.

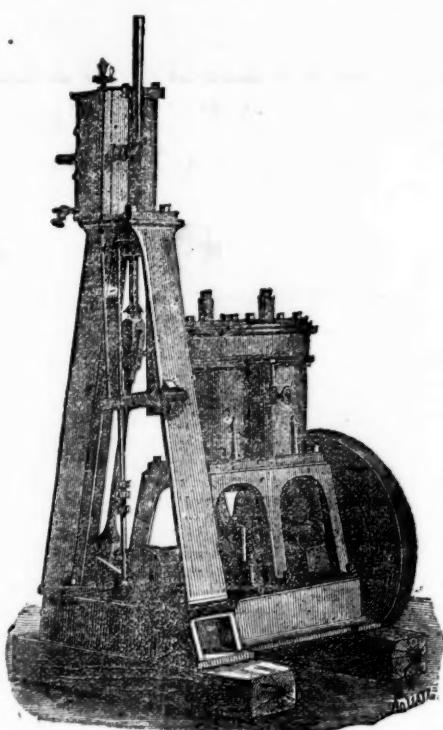
DRILL POINTS.—The saving in steel alone is considerable,—  
a drill will go through 20 feet of Aberdeen granite without  
sparking.

For testimonials, estimates, and other information, apply to—

T. BROWN & CO., Engineers, 96, Newgate-street, London, E.C.

RAVEN BROTHERS, Engineers (the Makers), Vauxhall Ironworks,  
Osborne-street, Manchester.

WILSON, McLAY, & CO., Sole Agents, 2, Talbot-court, Gracechurch-  
street, London, E.C.; and 87, St. Vincent-street, Glasgow.



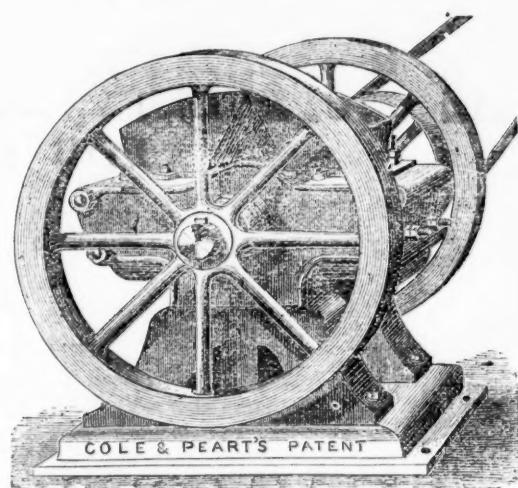
The peculiar advantages which enhance the value of this machine  
in the estimation of those who have it in practical use are—

First,—Its compactness compared with its power.

Second,—That by a nice adjustment of the cranks in the relation  
to each other the greatest power of the engine is applied at  
the exact point of the greatest resistance, so as to produce the  
best results at the least cost.

Third,—Heating of the piston and other parts is reduced to the  
minimum.

## THE STONE BREAKER AND QUARTZ CRUSHER.



Messrs. T. BROWN and CO. have the pleasure of introducing  
the improved machinery of Messrs. COLE and PEART for stone-  
breaking and quartz-crushing machinery, for crushing, grinding,  
and triturating stone, flint, cement, minerals, ores, chemicals, &c.,  
and for washing and separating metals from ores, and extracting  
gold from quartz. This machine accomplishes considerably more  
work, and costs less than any other similar machine. An impor-  
tant feature in it is by that a double action it produces road metal  
and fine stuff for mortar simultaneously, or it can be adjusted to  
break or crush to any required size.

Apply to—

**T. BROWN & CO.,**

**96, NEWGATE STREET, E.C.**

SOLE AGENTS.

Or their representatives—

**WILSON, McLAY, & CO.,**

**2, TALBOT COURT, GRACECHURCH  
STREET, E.C.;**

**87, ST. VINCENT STREET, GLASGOW.**

## CHARLES CHURCHILL AND CO., IMPORTERS AND FACTORS OF AMERICAN MACHINERY AND TOOLS,

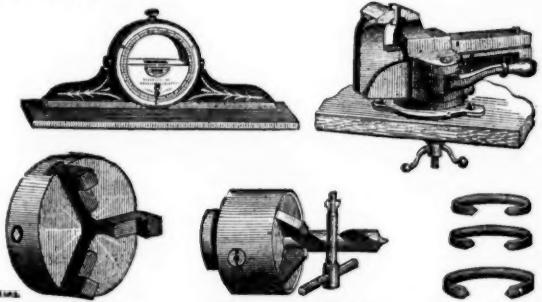
28, WILSON STREET, FINSBURY, LONDON, E.C.

SOLE AGENTS FOR

Morse's Twist Drill, and Machine Company's celebrated Twist  
Drills and Chucks; American Scroll Chucks; Stephens' Patent  
Vices; Parker's Patent Parallel and Swivel Vices; Gould Manu-  
facturing Company's Well and Cistern Pumps; Washita, Arkansas,  
and Hindostan Oil Stones; and all other descriptions of American  
Tools and Machinery, &c., &c.

C. C. and Co. are prepared to give quotations and execute in-  
dents for American Goods of all descriptions, to be shipped to any  
port.

CATALOGUES AND PRICES CURRENT ON APPLICATION.



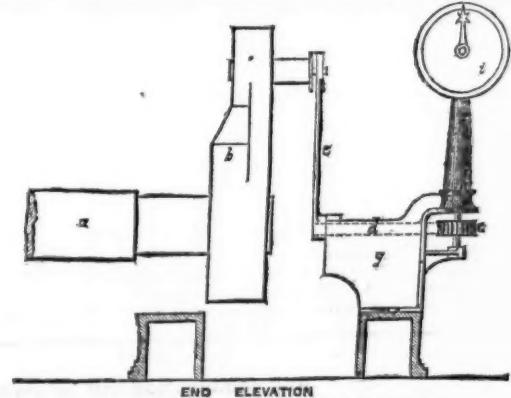
## PEPPER MILL BRASS FOUNDRY COMPANY, DARLINGTON STREET, WIGAN, COLLIERY FURNISHERS, BRASS FOUNDERS, COPPERSMITHS, & GAS METER MANUFACTURERS,

The PEPPER MILL BRASS FOUNDRY COMPANY beg respectfully  
to invite attention to their IMPROVED SELF-REGISTERING COL-  
LIERY WINDING INDICATOR, which, in addition to its ordinary use  
of indicating the position of the load in the shaft, registers the number of  
windings, thus enabling the manager at a glance, and at any moment, to  
check the return of the banksman or tallyman, by reading off from the dial  
the number of windings for any stated time.

This Indicator is especially adapted for Water Winding or Pumping. Its  
indications cannot possibly be tampered with, and unerringly show the  
number of windings or strokes for any stated period, so that it will at once  
be seen whether or not the person in charge has been fully discharging his  
duty.

These Winding Indicators are supplied either with or without the Self-registration Dial.

The Pepper Mill Brass Foundry Company will be glad to furnish, on ap-  
plication, sets of drawings illustrative of the simplest and cheapest mode  
of attaching their indicators to engines of various constructions, either  
vertical or horizontal.



One mode of attaching Indicator to horizontal engine.

These Indicators have been supplied to most of the principal Collieries in Lancashire, including Wigan Coal and Iron Co. (Limited); Ince Hall Coal and  
Iron Co. (Limited); Messrs. Jonathan Blundell and Son; John Grant Morris, Esq.; Messrs. Pearson and Knowles; Messrs. Andrew Knowles and Sons;  
S. W. Hugley; Mostyn Coal and Iron Co.; Messrs. Pilkington Bros., St. Helens.

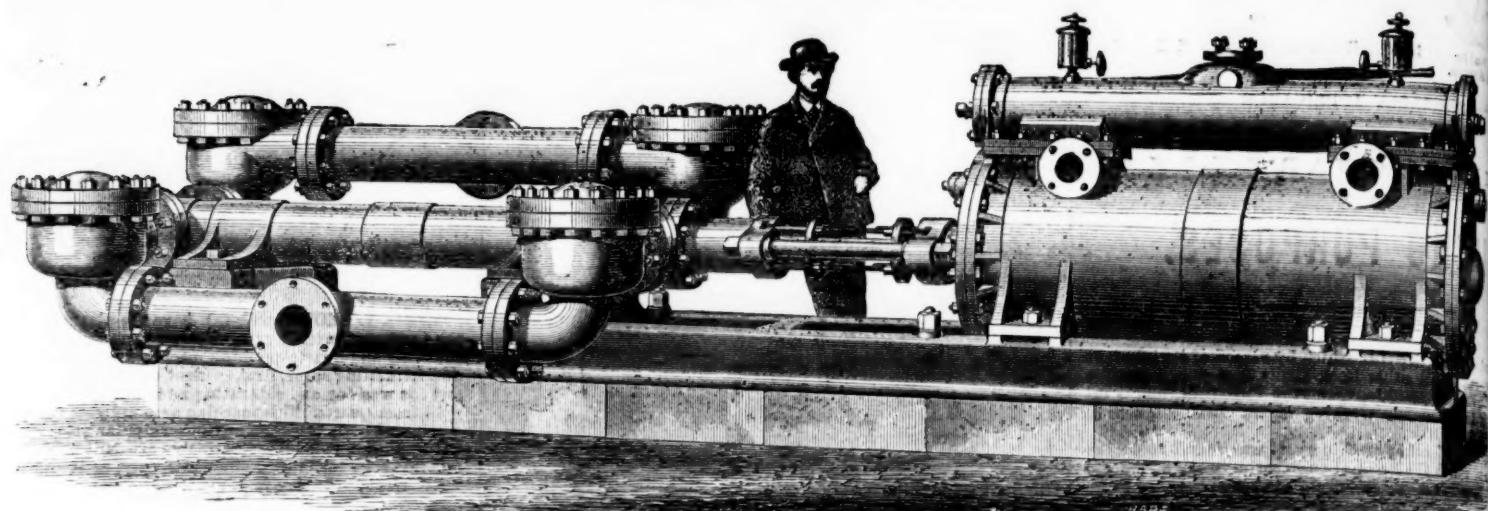
# TANGYE BROTHERS AND HOLMAN

## 10, LAURENCE POUNTNEY LANE, LONDON,

CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,  
NEWCASTLE-ON-TYME (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS,  
SOLE MAKERS OF

### THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGINES FOR FORCING WATER FROM MINES.

Nearly 3000 in Use.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork; allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

The accompanying engraving illustrates a large specimen of the "Special" Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

"These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The success of this system of pumps led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known

that we need now do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is 6½ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr. Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described

has since been made by Messrs. Tangye for Messrs. Collieries, Silverdale, Staffordshire. The steam cylinder is 32 in. diameter, and the water cylinder 10½ in. 6 ft., and the engine has to raise 22,500 gallons per hr. Two out of eight engines for some extensive coal mine are also in a forward state; each of these engines is of raising 150 gallons per minute, or 9000 gallons per hour. This system of underground pumping engine carries with it the recommendations of simplicity and with a small number of mechanical parts. Its first moderate, as compared with the method of raising water depths by a series of 40 or 50 ft. lifts. Its practical tested in 1867 by the award of a silver medal by the Polytechnic Society, which is composed chiefly of mining engineers. In fact, these engines appear to solve a very important question in mining operations—viz., the most economical means of deep mine drainage. Their success established in the coal mines of Durham and Newcastle, is the reason why their adoption should not follow, as occurs in the copper and tin mines of Cornwall, some of which are of great depth; and especially for foreign mines, where convenience and economy are of paramount consideration."

#### The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

Adelaide Colliery, Bishop Auckland.....	3 Pumps.	North Bitchburn Colliery, Darlington.....	2 Pumps.	Stott, James and Company, Burslem.....
Acombi Colliery, Hexham.....	1 "	Newton Cap Colliery, Darlington.....	1 "	Straker and Love, Brancepeth Colliery.....
Blackfell Colliery, Gateshead.....	1 "	Normanby Mines.....	1 "	Seaton Delaval Coal Colliery, near Newcastle.....
Black Boy Colliery, Gateshead.....	1 "	Oakenshaw Colliery.....	1 "	Thornley Colliery, Ferryhill.....
Castle Eden Colliery.....	2 "	Pease's West Colliery.....	2 "	Thompson, John, Gateshead.....
Carr, W. C., Newcastle.....	4 "	Pease, J. and J. W., near Crook.....	5 "	Trimdon Grange Colliery.....
Etherley Colliery.....	1 "	Pease, J. and J., Brandon Colliery.....	1 "	Tudhoe Colliery.....
Gidlow, T., Wigan.....	3 "	Pegswood Colliery, near Morpeth.....	2 "	Vobster and Mells Colliery.....
Haswell, Shotton and Easington Coal Company.....	3 "	Pelton Fell Colliery.....	1 "	Widdrington Colliery, Morpeth.....
Lochgelly Iron and Coal Company.....	2 "	Railey Fell Colliery, Darlington.....	1 "	Whitworth and Spennymoor Colliery.....
Lochore and Capelmoor Colliery.....	6 "	Right Hon. Earl Durham, Fence Houses.....	1 "	Westerton Colliery, Bishop Auckland.....
Leather, J. T., near Leeds.....	2 "	Skelton Mines.....	1 "	Wardley Colliery, Gateshead.....
Lumley Colliery, Fence Houses.....	1 "	South Benwell Colliery.....	5 "	Westminster Brymbo Coal Company.....
Monkwearmouth Colliery, Sunderland.....	1 "	St. Helens (Tindale) Colliery.....	1 "	Weardale Coal and Iron Company.....

#### PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder.....Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16
Diameter of Water Cylinder.....Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7
Length of Stroke.....Inches	24	24	36	24	36	48	24	36	48	36	36	48	36	72	36
Strokes per minute.....	50	30	20	30	20	15	30	20	20	15	20	20	15	10	20
Gallons per hour.....	2,200	2,200	2,200	3,900	3,900	3,900	6,100	6,100	6,100	6,100	8,800	8,800	8,800	8,800	11,900
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump.....	240	425	665	240	540	960	240	470	775	1,058	330	540	740	1,140	312
Diameter of Suction and Delivery.....Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5
Diameter of Steam Inlet.....Inches	2½	1½	1½	1½	2½	2½	1½	2½	3	3½	2½	3	3½	4	2½
Diameter of Exhaust.....Inches	1½	1½	1½	1½	2½	3	1½	2½	3½	4	2½	3½	4	5	3

#### PARTICULARS, &c.—Continued.

Diameter of Steam Cylinder.....Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	26	36
Diameter of Water Cylinder.....Inches	7	8	8	8	8	9	9	9	9	10	10	10	12	12	12
Diameter of Stroke.....Inches	72	36	48	72	72	36	48	48	72	72	72	72	48	72	72
Strokes per minute.....	10	20	15	10	20	15	15	15	15	10	10	10	15	10	10
Gallons per hour.....	11,900	15,660	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	35,240	35,240	35,240
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump.....	1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540
Diameter of Suction and Delivery.....Inches	5	6	6	6	6	7	7	7	8	8	8	8	10	10	10
Diameter of Steam Inlet.....Inches	5	3	4	5	5½	3	4	5	6	3½	5	6	7	4	6
Diameter of Exhaust.....Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	8	5	7

#### PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

**TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London.**

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 36, FLINT STREET, E.C., where all communications are requested to be addressed.—Feb. 8, 1872.